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THE

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OF

THE ASIATIC SOCIETY

OF

BENGAL.

VOL. V.

THE

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OF

THE ASIATIC SOCIETY

OF

BENGAL.

EDITED BY

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SECRETARY OF THE ASIATIC SOCIETY OF BENGAL; HON. MEM. OF THE AS. SOC. OF PARIS; COR. MEM. OF THE ZOOLOGICAL SOC. OF LONDON, AND OF THE ROYAL SOCIETIES OF MARSEILLES AND CAEN; OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, &c.

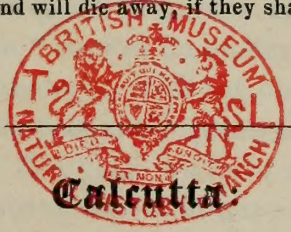
VOL. V.

JANUARY TO DECEMBER,

1836.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta; it will languish, if such communications shall be long intermitted; and will die away, if they shall entirely cease."

SIR WM. JONES.



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1836.

PREFACE.

Our aspirations on launching a fifth annual volume of the Journal into the ocean of literature are no longer tremulous from a diffident anxiety as to its reception ; the tide of popular favor, or at least the diminutive wave of it which reaches the secluded estuary of oriental research, has buoyed us up with the most flattering encouragement, and an increasing body of constituents has still pressed forward to freight our humble bark with the productions of their industry and talent. To extract any of the too complimentary phrases of our correspondents in Paris, Vienna, and London, would be egotism ; and we must not forget that a proportion of their praise may be merely stimulatory—inciting us to take advantage of the golden opportunities commanded by our position at the emporium, to amass a rich cargo for their more deliberate and erudite discussion hereafter. Our errors also have not escaped their due measure of criticism, but even thus they have been productive of a good effect in drawing forth more correct information from other sources. The commerce in which we are engaged, to continue the metaphor in the terms of a late French prospectus, " multipliera le capital de la science comme l'autre commerce multiplie celui du numeraire."

However we may thus boast of having added to the stock of knowledge, we fear the " capital du numeraire" has but little connection, beyond the analogy, with the out-turn of our speculation ; although, if the pecuniary prospects of the Journal are not much bettered this year, we have none to blame but ourselves for the unpromising aspect of our account current !

By increasing the letter-press more than 100 pages, and the plates in proportion, we felt we were exceeding the bounds of caution ; yet we could not resist the attempt to keep pace with the communications entrusted to us for publication, even at

some sacrifice and risk. Had our edition been sufficiently extensive to allow a large reserve for future sale, there might have been hopes of retrievement—but the 500 copies have all disappeared, and of our early volumes it is almost impossible now to procure a copy. The only method, then, left to meet this difficulty, is to levy a heavier assessment on our supporters for the future; and to this step, however reluctantly, we shall be obliged to resort from the beginning of the year 1837, still always adhering to our engagement of giving the maximum of matter for our means, and reminding our subscribers that we are not in fact heightening our charge, but enlarging our work; seeing that from 32 pages we have gradually augmented the monthly quota to 80, a quantity which experience has proved to be more than can be covered by a rupee subscription. Our rates from 1837, therefore, will be 1½ rupee per number to subscribers, and two rupees to others. The pecuniary details on which this measure is founded are as follows:

PAYMENTS. 1836.	Co.'s Rs.	A.	P.	RECEIPTS.	Co.'s Rs.	A.	P.
To Balance due 1st Jan...	675	3	7	By Collections in 1836,..	4319	0	0
To Establishment one year,	175	7	0	By Asiatic Society for copies supplied to Members in 1835, ...	1088	0	0
To Postages, ...	143	14	3	By sale in England,.....	336	8	0
To Binding, ...	209	4	7				
To Printer's Bill discharged, ...	4277	9	6				
To Engravings and Lithographs, ...	1566	5	0				
	7047	12	0		5743	9	1
OUTSTANDINGS.				DEPENDENCIES.			
To printing Bills unpaid for 1836, ...	5221	0	0	By Subscriptions due for 1836, in Calcutta, ...	960	13	3
				Ditto Mofussil, ...	1100	0	0
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	12,268	12	0		10,880	3	8
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If, in our last volume, we could not refrain from noticing, as the most prominent object of interest in its contents, the suspension of oriental publications by the British Indian Government, and the general discouragement under which oriental studies were doomed to languish; we must not on the present occasion omit to make honorable mention of the patronage and

favor which has once more dawned upon science and literature in India under the present administration. The proceedings of the Asiatic Society, last year so full of painful discussion and unsuccessful appeal, this year shine forth with tokens of distinguished consideration. Consulted on the merit of propositions connected with historical research in the Peninsula and in Ceylon, its recommendations have met that attention which dignifies its proceedings, and tends more than any thing else to render it a substantive and useful institution. The sanction of its auspices has been courted, and has been extended beneficially to publications of great magnitude and importance. It has itself engaged in a new sphere of operations, devolved upon it by the discussions of last year, which promises, by a judicious combination with the sister Societies of France and England, to become equally advantageous to the European scholar, and profitable to itself. The Society of Paris has been the foremost to volunteer its co-operation in the completion of the series of suspended oriental works; but we have reason to know that the Royal Asiatic Society of London has not espoused their cause less warmly or less successfully, although the unavoidable delays of references to high authorities have prevented our yet reaping the fruits of their influence and intercession.

Many will consider with ourselves that the publication of a full edition of the oriental classics is a perfectly legitimate branch of labour for an Asiatic Society, and they may hope to see it permanently continued under endowment and protection of the Government itself.—It may indeed be regarded as a judicious modification of one of the earliest intentions of the institution promulgated in July, 1806, but hitherto left a dead letter on its minutes, "that a series of volumes, to be entitled BIBLIOTHECA ASIATICA, be published by the Society distinct from the *Asiatic Researches*, containing translations of short works in the Asiatic languages, and extracts and descriptive accounts of books of greater length, gradually extending to all Asiatic books deposited in the Society's library, and even to all works extant in the languages of Asia."

The translation and critical examination of Oriental works at the present day can be better undertaken by the distinguished

professors and philologists of Europe, and the only department of which we can hope to relieve them, with any chance of success, is the collection and correct printing of original texts through the supervision of our native Pandits and Maulavís. We therefore hope to see fresh volumes put in hand now that the series transferred by the Committee of Education is so nearly completed; and we would respectfully suggest, that the Government should make over to the Society all of the Sanscrit, Arabic, and Persian works that have hitherto issued from the Education Press, in order that one system of distribution and sale may be regulated for the whole series; and that, under the name of the Bibliotheca Asiatica, this body of Indian classical lore may be encouraged and regarded in the light of a national undertaking, entrusted merely to the vigilant superintendence of the Society as the appropriate organ of their publication.

But we are dwelling too long on a favorite project, and have but little space left to allude to the equally prosperous fortune of the natural sciences during the present year. The sincere votary of science cannot have witnessed without pleasurable anticipations the introduction, altogether novel in this country, of the delightful and instructive experiments of natural philosophy among the social recreations of Government House. At these parties may be kindled into action many a dormant disposition to cultivate the sciences that has hitherto but wanted such a stimulus; and the community at large may learn to appreciate the studies they have been accustomed to eschew as vain or recondite, by witnessing their practical application and attractions. We have heard it suggested as an improvement on the plan adopted by the illustrious Patron of the Society, to hold these soirées directly at the Society's museum, where the objects to be explained or exhibited might be prepared more at leisure, and where they would remain classified with others in the same collection;—others again have advocated the giving of a more decidedly lectural character to the evening's exposition. In London, where the President of the Royal Society holds similar meetings, his visitors are already well grounded in the subjects treated of, and need but a glance at any new invention or experiment to comprehend its drift: but

in India the majority have not enjoyed the same opportunities, and their curiosity is merely raised without hope of entire satisfaction. But against this view it may be urged that a monthly lecture would be but a tardy mode of communicating knowledge, more especially if the subject were to be changed on each occasion. A course of lectures might be a good succedaneum to the system, but the spirit of the monthly re-union must be general and exhibitory, to answer the object intended.

Again we are insensibly falling into a review of matters beyond the proper scope of a Preface, which should confine itself to the contents of the volume it precedes, or to the mutual concerns of the editor and his constituents.

On the cover of more than one monthly Journal we have already explained to what extent we have been enabled to increase the number and accuracy of our lithographed plates this year, by putting in requisition the talents of our mofussil friends. When the facilities of drawing on transfer paper for lithographic printing become more generally known, we may expect still further advantage from its adoption by travellers, engineers, botanists, and naturalists, who are, or ought to be, artists also. It is now known from actual experience that a transfer drawing, packed in a tin roll, may be subjected to a journey of 1000 miles, either in the hottest or the dampest period of the year with impunity. Most of the imperfections in the plates of the Sewalik fossils are due to want of care in passing them on to the stone, rather than to imperfections in the original drawings.

Some confusion has arisen this year, in the numbering and placing of the plates, from continual and unavoidable postponements which it is needless to particularize. One plate (of the *Bhitarí* inscription) has been reserved for the ensuing volume, that full justice may be done to the able elucidation of its important contents. And here we may be allowed a moment's exultation at the highly curious train of discovery, connected with this monument, which has been developed in the pages of the Journal. Not only has a dynasty before wholly unknown to the Indian historian, been traced by coins and inscriptions through seven generations in its own line, but two collateral alliances with other reigning princes

have been brought to light: while extracts from ancient Chinese authors, independently scrutinized in Europe, have helped to determine their exact chronological epoch.

In numismatic research discovery has been no less rife. The theory of a Grecian origin has been extended to various other series of Hindu coins—and the only one (the *Varáha* series) which remained of a doubtful source, has recently been traced in a most satisfactory manner to the Sassanian coinage of Persia, as will hereafter be shewn. We may here correct an ignorant error into which we have fallen in describing the legend of Doctor SWINEY's coin of AGATHOCLEA—giving the epithet θεοτροπη, as if derived from τρεφω instead of τρεπω; to this our attention has been called by several correspondents—and we therefore thus conspicuously acknowledge our blunder. The true meaning of the epithet (written θεοτροπου though united to βασιλισσας) we conceive to be "godly-dispositioned."

We must also caution our readers against implicitly adopting our version of the Bactro-Pehlevi character—for we are now in possession of the comparative alphabet lithographed by M. JACQUET, which differs in many respects from our system, grounding it upon the Syriac instead of the Zend.—Not having yet seen the author's memoir on the subject, we are unable to make known his system, although we cannot doubt its superiority to our crude attempt.

In fossil geology one immense step has been made this year, by the discovery of the remains of a quadrumanous animal, the nearest approach to the human being that has yet been found in a fossil state in company with the extinct monsters of primeval antiquity. This important addition has enriched the Dádupur museum; but no less interesting have been the additions to its worthy rival the museum of Seháranpúr. It is perhaps right to explain how it has happened that the papers of Lieuts. BAKER and DURAND have mostly appeared in the journal, while those of Dr. FALCONER and Captain CAUTLEY have graced the new volume of the Researches. This selection was made from no difference in the relative value of these most interesting papers, but solely to accommodate best the drawings which accompanied them. We hope at some future period, to see the whole series collected together into a com-

plete and luxurious work on the fossil osteology of the Himálayan range ; but such an undertaking should await the exploration of the whole line, and should be made a national concern. At present the great fear is, lest the quantity of specimens dispersed in private collections on all sides, may deprive us of many fragments requisite to work out the forms of the curious new animals disinterred from this vast cemetery of the ancient world.

We have partly redeemed our promise to our meteorological contributors: sufficiently so, we hope, to revive their exertions, and procure us a combined series of observations in different parts of India for the coming year, more extended than the comparative tables we have now published. We regret having been unable to supply Barometers to the numerous applicants who have volunteered to use them. The duty now levied on philosophical instruments, will tend still more to check their importation.

Our readers will now readily excuse the absence of articles on the progress of the sciences in Europe, since that department has been zealously pursued by another periodical of extensive circulation, in consequence partly of our neglect of it ; and a third rival has recently entered the field under promising and powerful auspices. These have so fully made known many local inventions of scientific interest, that we have less regretted our inability to find space for their re-insertion. We would, on no account, however, wish to confine our pages to subjects more strictly Indian ; on the contrary, we shall ever study to infuse into them a pleasing variety of original information on all subjects, of man's performance or nature's production, within the wide range prescribed to us by our allegiance to the Asiatic Society.

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CONTENTS.

No. 49.—JANUARY. *Page*

I.—Second Memoir on the Ancient Coins found at Beghrám, in the Kohistán of Kábul. By Charles Masson, ... 1

II.—Quotations from original Sanscrit authorities in proof and illustration of Mr. Hodgson's sketch of Buddhism, ... 28

III.—Sivatherium Giganteum, a new Fossil Ruminant Genus, from the Valley of the Markanda, in the Siválik branch of the Sub-Himálayan Mountains. By Hugh Falconer, M. D., Superintendent Botanical Garden, Seháranpur, and Captain P. T. Cautley, Superintendent Doáb Canal, ... 36

IV.—Horary Observations of the Barometer, Thermometer, and Wet-bulb Thermometer, made at Calcutta on the 21st and 22nd of December, 1835, by Mr. H. Barrow, Astr. and Math. Inst.-maker to the H. C. .. 51

V.—Proceedings of the Asiatic Society, ... 52

VI.—Meteorological Register, ... 60

No. 50.—FEBRUARY.

I.—Account of Rumbówe, one of the States in the interior of Malacca. By Lieut. T. J. Newbold, 23rd Regt. Madras Native Infantry, ... 61

II.—Quotations from Original Sanscrit Authorities in proof and illustration of Mr. Hodgson's Sketch of Buddhism, ... 71

III.—Notes explanatory of a Collection of Geological Specimens from the country between Hyderabad and Nágpur. By J. G. Malcolmson, Assistant Surgeon, Madras Establishment, Pl. V. 96

IV.—Description of a New Species of Columba. By B. H. Hodgson, Esq. Resident in Nèpál, ... 122

V.—Proceedings of the Asiatic Society, ... 124

VI.—Meteorological Register, ... 128

No. 51.—MARCH.

I.—Memoir of the Life and Writings of St. Nierses Clajensis, surnamed the Graceful, Pontiff of Armenia. By Johannes Avdall, ... 129

II.—Discovery of Buddhist Images with Deva-nágarí Inscriptions at Tagoung, the Ancient Capital of the Burmese Empire. By Colonel H. Burney, Resident at Ava, ... 157

III.—On the preparation of Opium for the China market: written in March 1835, and then communicated to the Benares and Behár Agencies. By D. Butter, M. D., Surgeon 63rd B. N. I., late Opium Examiner of the Benares Agency, ... 165

IV.—Catalogue of a Second Collection of Fossil Bones presented to the Asiatic Society's Museum, by Colonel Colvin, ... 179

V.—Notice of a Visit to the Valley of Cashmír in 1836. By the Baron Hugel, 184

VI.—Note on an Inscription at Bamián. By Mr. C. Masson, ... 188

VII.—Proceeding of the Asiatic Society, ... 189

VIII.—Meteorological Register, ... 192

Page

No. 52.—APRIL.

I.—Account of the Mountain Tribes on the extreme N. E. Frontier of Bengal. By J. McCosh, Civil Assistant Surgeon, Goálpára, ... 193
II.—On the method employed to remove the Vaulted Roof of St. Peter's Church in Fort William, illustrated by a Section, (Plate V.) .. 208
III.—Statistical, Agricultural, and Revenue Return of Muthra District, made up to 1st October, 1835. By Capt. R. Wroughton, Rev. Surveyor, .. 216
IV.—Notes on the State of the Arts of Cotton Spinning, Weaving, Printing, and Dyeing in Nepál. By Dr. A. Campbell, attached to the Residency, .. 219
V.—Summary Description of some New Species of Falconidæ. By B. H. Hodgson, Esq. 227
VI.—Synoptical Description of sundry New Animals, enumerated in the Catalogue of Nipálese Mammals. By B. H. Hodgson, Esq. .. 231
VII.—Note on the occasional existence of fresh-water on the surface of the ocean. By Mr. C. Brownlow, ... 239
VIII.—Note on the Cervus Duvaucelii of Cuvier, or C. Elaphoides and Bahraiya of Hodgson, ... 240
IX.—Horary Observations of the Barometer, Thermometer, and Wet-bulb Thermometer, made at Calcutta on the 21st and 22nd of March, 1836. By Mr. H. Barrow, H. C. Mathematical Instrument-maker, ... 243
X.—Proceedings of the Asiatic Society, ... 245
XI.—Miscellaneous :—
1.—Postscript to the Account of the Wild Goat of Nepál, printed in the Sept. No. of the Journal, page 490. By B. H. Hodgson, Esq. .. 254
2.—Notice of the Basilosaurus, a new marine fossil Saurian, discovered in America. By H. Piddington, Esq. *ib.*
3.—The Balloon, ... 255
XII.—Meteorological Register, ... 256

No. 53.—MAY.

I.—Johóle and its former Dependencies of Jompóle Gominchi. By Lieut. J. F. Newbold, A. D. C. to Brigadier General Wilson, C. B. 257
II.—Interpretation of the Tibetan Inscription on a Bhotian Banner, taken in Assam, and presented to the Asiatic Society by Captain Bogle. By M. Alexander Csoma Körös. [See Pl. VI. fig. 3.] 264
III.—Note on some of the Indo-Scythic Coins found by Mr. C. Masson at Beghrám, in the Kohistán of Kábul. By Johannes Avdall, Esq. M. A. S. 266
IV.—Notes on the Geology, &c. of the Country in the Neighbourhood of Maulamyeng (*vulg.* Moulmein). By Capt. W. Foley, ... 269
V.—On the Revolution of the Seasons. By the Rev. R. Everest, ... 281
VI.—Recent Discovery of Fossil Bones in Perim Island, in the Cambay Gulph. By Baron Hugel and Mr. Geo. Fulljames, ... 288
VII.—Table of Sub-Himálayan Fossil Genera, in the Dádúpur Collection. By Lieuts. W. E. Baker and H. M. Durand, Engineers, ... 291
VIII.—Note on the Teeth of the Mastodon à dents etroites of the Siwálik Hills. By Captain P. T. Cautley, Pl. XI. 294
IX.—Meteorological Register kept at Bangalore. By Dr. J. Mouat, Medical Surgeon, 13th Dragoons, ... 296
X.— Meteorological Observations taken every hour, at Bangalore, in the Hospital of H. M. 13th Dragoons, from 6 A. M. of the 21st to 6 P. M. of the 22nd March, 1836, inclusive, in conformity with Sir W. Herschel's instructions. By the same, ... 293

Page

XI.—Horary Observations taken at Dádúpur, in conformity with Sir John Herschel's Circular. By Col. Colvin, Lieut. Baker, and Lieut. Durand, Engineers, ... 299

XII.—Proceedings of the Asiatic Society, ... 302

XIII.—Address read before the Bombay Branch of the Royal Asiatic Society, on the 27th January, 1836. By the Rev. John Wilson, President, .. 304

XIV.—Miscellaneous:—

1.—On the Canis Vulpes montana, or Hill Fox. By J. T. Pearson, Asst. Surg., Cur. Mus. As. Soc. 313

2.—On the Soil suitable for Cotton, Tobacoo, Sugar, and the Tea plant. By H. Piddington, ... 314

3.—Action of Copper on Ink, ... 317

4.—Suspension Bridge at Fribourg in Switzerland, ... 318

XV.—Meteorological Register, ... 320

No. 54.—JUNE.

I.—Notes on the Buddhas from Ceylonese authorities, with an attempt to fix the dates of the appearance of the last four; being those of the Mahá Bhadra Kalpa, (or Present Age.) By Captain J. Forbes, H. M. 78th Highlanders, ... 321

II.—Memoir of a Hindu Colony in Ancient Armenia. By Johannes Avdall, Esq., M. A. S. 331

III.—Facsimiles of various Ancient Inscriptions, ... 340

IV.—Descriptive Catalogue of Terrestrial and Fluviatile Testacea, chiefly from the North-east Frontier of Bengal. By W. H. Benson, Esq. B. C. S. .. 350

V.—Description of two new species belonging to a new form of the Meruline Group of Birds, with indication of their generic character. By B. H. Hodgson, Esq. Resident in Nepál, ... 358

VI.—On a New Genus of the Meropidæ. By the same, ... 360

VII.—On a New Piscatory Genus of the Strigine Family. By the same, .. 362

VIII.—Report of the Society of Arts on Specimens of Rice, Wool, &c. from Nepál and Assam, ... 365

IX.—Proceedings of the Asiatic Society, ... 369

X.—Meteorological Register, ... 376

No. 55.—JULY.

I.—Translation of a Támba Patra, which was found in a field of the village of Pipliánagar in the Shujálpur Parganá by a Krisán engaged in ploughing, and presented to Mr. L. Wilkinson, the Political Agent at Bhopál by the Jagirdár, ... 377

II.—Note on the white satin embroidered Scarfs of the Tibetan Priests. By Major T. H. A. Lloyd. With a translation of the motto on the margin of one presented to the Asiatic Society. By Alex. Csoma Körösi, .. 383

III.—Note on the origin of the Armenian Era, and the reformation of the Haican Kalendar. By Johannes Avdall, Esq. M. A. S. 384

IV.—Conjectures on the march of Alexander. By M. Court, ancien éleve de l'école militaire de St. Cyr. 387

V.—Experimental Researches on the Depressions of the Wet-bulb Hygrometer. By James Prinsep, F. R. S. Sec. As. Soc. 396

VI.—Proceedings of the Asiatic Society, ... 433

VII.—Miscellaneous, ... 439

VIII.—Meteorological Register, ... 440

Page

No. 56.—AUGUST.

I.—Extracts from the Mohit (the Ocean), a Turkish work on Navigation, in the Indian Seas. Translated and communicated by Joseph Von Hammer, Baron Purgstall, Aulic Counsellor, and Professor of Oriental Languages at Vienna, Hon. Memb. As. Soc. &c. &c... 441

II.—Extracts translated from a Memoir on a Map of Peshâwar and the country comprised between the Indus and the Hydaspes, the Peucelaotis and Taxila of ancient geography. By M. A. Court, in the service of Mahárája Ranjit Singh, ... 468

III.—Facsimiles of Ancient Inscriptions, lithographed by James Prinsep, Sec. &c. 482

IV.—Sub-Himálayan Fossil Remains of the Dádúpur Collection. By Lieuts. W. E. Baker and H. M. Durand, Engineers, ... 486

V.—Note on the States of Pérak, Srímenanti, and other States in the Malay Peninsula. By T. J. Newbold, Lieut., A. D. C. to Brigadier General Wilson, C. B. 505

VI.—Proceedings of the Asiatic Society, ... 509

VII.—Meteorological Register, ... 520

No. 57.—SEPTEMBER.

I.—Examination of some points of Buddhist Chronology. By the Hon. George Turnour, Ceylon Civil Service, ... 521

II.—Third Memoir on the ancient Coins discovered at the site called Beghrám in the Kohistán of Kábul. By Mr. Charles Masson, ... 537

III.—New varieties of Bactrian Coins, engraved as Plate XXXV. from Mr. Masson's Drawings and other sources. By James Prinsep, Sec. .. 548

IV.—Facsimiles of Ancient Inscriptions, lithographed by Jas. Prinsep, Sec. &c. &c. 554

V.—Sketch of the State of Múar, Malay Peninsula. By T. J. Newbold, Lieut., A. D. C. to Brigadier General Wilson, C. B. 561

VI.—Note on the discovery of a relic of Grecian Sculpture in Upper India. By Lieut.-Col. L. R. Stacy. Plate XXXI. 567

VII.—Description of some Grasses which form part of the Vegetation in the Jheels of the District of Sylhet. By William Griffith, Esq. Assistant Surgeon, Madras Establishment, ... 570

VIII.—Notes on Delhi Point, Pulo-Tinghie, &c. and on some Pelagic Fossil remains, found in the rocks of Pulo-Lédah. By Wm. Bland, Esq. Surgeon, H. M. S. Wolf, ... 575

IX.—Fossil Remains of the smaller Carnivora from the Sub-Himálayas. By Lieut. W. E. Baker and Lieut. H. M. Durand, Engineers, ... 579

X.—Continuation of a Paper (Journal, May, 1835), on the Heights of the Barometer as affected by the position of the Moon. By the Rev. R. Everest, ... 585

XI.—Proceedings of the Asiatic Society, ... 587

XII.—Meteorological Register, ... 600

No. 58.—OCTOBER.

I.—An account of some of the Petty States lying north of the Tenasserim Provinces ; drawn up from the Journals and Reports of D. Richardson, Esq., Surgeon to the Commissioner of the Tenasserim provinces. By E. A. Blundell, Esq. Commissioner, ... 601

II.—Outline of Political and Commercial Relations with the Native States on the Eastern and Western Coasts, Malay Peninsula. By T. J. Newbold, Lieut., A. D. C. to Brigadier General Wilson, C. B. .. 626

Page

III.—A brief account of Masúd, known by the name of Farid Shakarganj, or Shakarbár. By Munshí Mohan Lál, ... 635
IV.—New varieties of the Mithraic or Indo-Scythic Series of Coins and their imitations. By James Prinsep, Sec. As. Soc. &c. 639
V.—Facsimiles of various Ancient Inscriptions, lithographed by James Prinsep, Secretary As. Soc. &c. 657
VI.—Sub-Himálayan Fossil Remains of the Dádúpur Collection. By Lieuts. W. E. Baker and H. M. Durand, Engineers, ... 661
VII.—Note on the occurrence of Volcanic Scoria in the Southern Peninsula. By Lieut. J. T. Newbold, A. D. C. 670
VIII.—Postscript to the account of Ursitaxus, printed in the 19th Vol. of Researches As. Soc. By B. H. Hodgson, Esq. 671
IX.—Proceedings of the Asiatic Society, ... 672
X.—A General Statement of the Labors and Proceedings of the Expedition to the Euphrates, under the command of Colonel Chesney, Royal Artillery, F. R. S. 675
XI.—The Governor General's Conversazioné, ... 682
XII.—Meteorological Register, ... 684

No. 59.—NOVEMBER.

I.—Notice of the Vallabhí dynasty of Saurashtra ; extracted from the Buddhist records of the Chinese. By M. Eugene Jacquet, Member of the As. Soc. of Paris, ... 685
II.—An account of some of the Petty States lying north of the Tenasserim Provinces ; drawn up from the Journals and Reports of D. Richardson, Esq., Surgeon to the Commissioner of the Tenasserim Provinces. By E. A. Blundell, Esq., Commissioner, ... 688
III.—Notes on the Antiquities of Bámián. By C. Masson, ... 707
IV.—New types of Bactrian and Indo-Scythic Coins, engraved as Plate XLIX. By James Prinsep, Sec. &c. 720
V.—Facsimiles of various Ancient Inscriptions, lithographed. By James Prinsep, Sec. &c. 724
VI.—Some remarks on the development of Pollen. By William Griffith, Assistant Surgeon, Madras Establishment, ... 732
VII.—Sub-Himálayan Fossil Remains of the Dádúpur Collection. By Lieuts. W. E. Baker and H. M. Durand, Engineers, ... 739
VIII.—Descriptive Catalogue of a collection of Land and Fresh-water Shells, chiefly contained in the Museum of the Asiatic Society. By W. H. Benson, Esq. B. C. S. 741
IX.—Note on Zoological Nomenclature. By B. H. Hodgson, Esq. .. 751
X.—Proceedings of the Asiatic Society, ... 753
XI.—Meteorological Register, ... 760

No. 60.—DECEMBER.

I.—Geological Notes on the Northern Conkan, and a small portion of Guzerat and Kattywár. By Charles Lush, M. D. 761
II.—Note on Mastodons of the Sewaliks. By Capt. P. T. Cautley, Superintendent of the Doab Canal. Pl. XL. 768
III.—Additions to the Ornithology of Népal. By B. H. Hodgson, Esq.
1.—Indication of a new Genus of Insessorial Birds, ... 770
2.—Indication of a new Genus of Waders, belonging to the Charadriatic Family, ... 775
3.—Indication of a new Genus of the Falconidæ, ... 777

Page

4.—Indication of a new Genus of the Picidæ, with description of the type. A new species, also, of two new species of the Genus Sitta, .. 778

5.—New species of Hirundinidæ, ... 779

IV.—Description of the Shell and Animal of Nematura, a new Genus of Mollusca, inhabiting situations subject to alternations of fresh and brackish water. By W. H. Benson, Esq. B. C. S. 781

V.—Note on the Genus Pterocyclos of Mr. Benson and Spiraculum of Mr. Pearson. By Dr. William Bland, ... 783

VI.—Note on the Nautical Instruments of the Arabs. By James Prinsep, Sec. 784

VII.—Facsimiles of Ancient Inscriptions, lithographed. By ditto, ... 795

VIII.—Description of Uch-Sharíf. By Munshí Mohan Lál. 796

IX.—Specimens of the Soil and Salt from the Sámar, or Sambhur lake salt-works. Collected by Lieut. Arthur Conolly, and analyzed by Mr. J. Stephenson, ... 798

X.—Remarks on a collection of Plants, made at Sadiyá, Upper Assam, from April to September, 1836. By William Griffith, Assistant Surgeon, Madras Establishment, on duty in Upper Assam, ... 806

XI.—Note on a Remnant of the Hun Nation. [Vide Chap. 26 of the "Decline and Fall of the Roman Empire" under the head of "Original Seat of the Huns."] By Captain W. Foley, ... 813

XII.—Table shewing the breadth of the river Satlaj and the rate of its current at different stages, from Harríke Pattan to its junction with the Indus at Mithankot, ... 814

XIII.—A Comparative view of the daily range of the Barometer in different parts of India. By James Prinsep, Sec. As. Soc. &c. 816

XIV.—Postscript to the Memoir on the Depression of the Wet-bulb Thermometer published in the July number. By the same, ... 828

XV.—Proceedings of the Asiatic Society, ... *ib.*

XVI.—Meteorological Register, ... 836

ERRATA.

In the Journal for May, 1834, page 253, *for* ' 58°' *read* ' minus 58°.'

In the No. for Dec. 1835, page 655 et. seq. the title of the Usbeck chief is printed WAUG, instead of WANG, or اونگ. The term is rendered by the Missionaries *regulus*, and is perhaps equivalent to *Rája* under the Mughal governments.

In the same volume, page 615, *for* ' Zenophon' *read* ' Xenophon.'

Page 30 line 2 of note, *for* ' preferred,' *read* ' postponed.'

,, (et passim) *for* ' Sangata,' *read* ' Saugata.'

Page 30 line 3 of note, insert ' *this*' before ' appears.'

,, 31 ,, 9 *for* ' exotic,' *read* ' the exotic origin of Buddhism.'

,, 32 ,, 18 *for* ' Boddhi,' *read* ' Bodhi.'

,, 34 ,, 8 *for* ' Sraxaka,' *read* ' Sravaka.'

,, 36 ,, 6 of note, *for* ' E. G. Elplinstone,' *read* ' e. g. Elphinstone.'

,, 41 ,, 29 *for* ' shells,' *read* ' cells.'

,, 42 ,, 21 erase ' on' after the semi-colon.

,, 44 ,, 44 *for* ' palatial,' *read* ' palatine.'

,, 47 ,, 27 *for* ' this,' *read* ' these.'

,, 57 ,, 48 *for* ' in vertical plates,' *read* ' into vertical plates.'

,, 49 ,, 1 *for* ' insymmetrical,' *read* ' unsymmetrical.'

,, 49 ,, 23 *for* ' circle,' *read* ' arch.'

,, 72 ,, 6 *for* ' as,' *read* ' so.'

,, 74 ,, 4 from bottom, in note, for end, *read* ' ens.'

,, 75 ,, 1 of note, dele the brackets.

,, 79 ,, 23 after ' percipient powers,' add the words, ' the Karmika tenets amount to idealism.'

,, 80 ,, 4 from bottom, *for* ' Bauddhy,' *read* ' Bauddha.'

,, 85 ,, 15 *for* ' existence,' *read* ' assistance.'

,, 86 ,, 26 *for* ' by,' *read* ' but.'

,, 87 ,, 3 of the note, put the stop *before* the word Sutra.

,, 88 ,, 1 and 3 of the note, *for* ' Dharmadya,' *read* ' Dharmodya.'

,, 161 In Col. Burney's notice of Tagoung, *for* ' being,' *read* ' building.'

,, 167 ,, 10 *for* ' tiers,' *read* ' tears.'

,, 170 ,, 32 *for* ' obstructed,' *read* ' abstracted.'

,, 172 ,, 37 and elsewhere, *for* ' venous,' *read* ' vinous.'

,, 175 ,, 35 *for* ' mass,' *read* ' marc.'

,, 176 foot note, ditto ditto.

,, 176 ,, 19 *for* ' extraction,' *read* ' extractive.'

,, 179 ,, 1 *for* ' paséwa, converted,' *read* ' paséwa-converted.'

,, 196 ,, 12 *for* ' same,' *read* ' Lama.'

,, — ,, 13 *for* ' Bis Bisa,' *read* ' Bisa.'

,, 199 ,, 14 omit *cut*.

,, 200 ,, 29 *for* ' lines,' *read* ' Hills.'

,, — ,, 36 *for* ' Busa,' *read* ' Bisa,' (in all.)

,, 202 ,, 18 *for* ' country,' *read* province.'

,, 204 ,, 33 *for* ' *the* spirit,' *read* ' that spirit.'

,, — ,, 34 *for* ' Bennet,' *read* ' Burnett.'

,, 204 ,, 11 *for* ' stones,' *read* ' stone.'

,, — ,, — *for* ' Off,' *read* ' out.'

,, 264 ,, 1 *for* ཆད་ *read* ཅད་

,, ,, 3 སོ་མས་རེ་མས་ སོ་མས་་རེ་མས་

,, 265 ,, 2 ལེ་ ལོ་

,, 4 མང་ པང་

,, 7 སྐྱེ་ སྐེ་

,, 11 ལྷང་ ལྟུང་

,, 12 ཞིང་ ཞིད་

,, 13 leave out the word མཁ་

At the bottom *for* རྒྱ་ལ *read* རྒྱ་ལ

Page 265 line 11, of the Tibetan text *for* khed, *read* khyed.
„ 228 „ 3 from below, *for* ‘ speculated’ *read* ‘ operculated.’
„ 235 „ 19 *insert the full stop* (*now after* only) *after* ‘ presume.’
„ 443 „ 31 *insert* ‘ at’ *before* ‘ Cape Guarda fui.’
„ „ 32 *for* ‘ inch’ *read* ‘ inches.’
„ 351 „ 11 from bottom, *for* ‘ satures,’ *read* ‘ sutures.’
„ 353 „ 18 ditto, *for* ‘ Hylvoides,’ *read* ‘ Styloides.’
„ — „ 3 ditto, *for* ‘ confortissime,’ *read* ‘ confertissime.’
„ 354 „ 19 from top, *for* ‘ malassan,’ *read* ‘ Malayan.’
„ — „ 3 from bottom, *for* ‘ Gangetica,’ *read* ‘ faciata.’
„ 355 „ 7 from top, *for* ‘ ditto,’ *read* ‘ ditto.’
„ — „ 22 ditto, *for* ‘ instructis,’ *read* ‘ instructâ.’
„ 356 „ 5 ditto, (and in note,) *for* ‘ tabular,’ *read* ‘ tubular.’
„ — „ 23 ditto, *for* ‘ operation,’ *read* ‘ operculum.’
„ 357 „ 2 from bottom, *after* sinus, *insert* to form a closed circle, the horns.
„ — „ 6 ditto, (note,) *for* ‘ Pesticia,’ *read* ‘ Justicia.’
„ 358 „ 2 from top, *for* ‘ tabular,’ *read* ‘ tubular.’
„ — „ 13 ditto, *for* ‘ Demarara,’ *read* ‘ Demerara.’
„ 418 „ 8 *after* about, *insert* 27.

„ 420 in heading of lower table, *for* increment $d + \frac{30}{p} d$, *read*

$$d \times \frac{30}{p} d.$$

„ 421 „ 2 *for* simply, $d - \frac{0}{p}$ *read* simply, $d - \frac{30}{p}$

„ In heading of lower table, *under* Barometer *supply p.*
„ 424 line 3 *for* ‘ of wet-bulb,’ *read* ‘ of the wet-bulb thermometer.’
„ 721 „ 13 *for* ‘ the god-nourisher,’ *read* ‘ the heavenly-minded,’ and cancel the subsequent remarks.
„ 723 „ 24 *for* ‘ General Arnold,’ *read* ‘ Dr. Gerard.’

Capt. Cunningham having pointed out that the *p* in the legend of the *Samudra-gupta* coin described in Vol. iv. p. 635, as *ápati rurha*, has an *r* subjoined; we have again sought in the dictionary for a better explanation of the epithet and have found it in the word अप्रतिरथः *apratiratha*, ‘ the warrior.’

Page 742 line 14 from top, *for* ‘ behind,’ *read* ‘ beyond.’
„ 744 „ 1 from bottom, *for* ‘ Butta,’ *read* ‘ Bulla.’
„ 748 „ 7 from bottom, *for* ‘ spora,’ *read* ‘ spira.’
„ — „ 5 from do., *for* ‘ ingrescente,’ *read* ‘ nigrescente.’
„ 750 „ 19 from top, *for* ‘ salcis,’ *read* ‘ sulcis,’ and *for* ‘ vinis,’ *read* ‘ binis.’
„ — „ 7 from bottom, *for* ‘ carino,’ *read* ‘ carina,’ and *for* ‘ compresso,’ *read* ‘ compressâ.’

LIST OF PLATES.

		Page
Plate I.	Sivatherium Giganteum, folded,	48
II. III. IV.	Masson's Bactrian Coins and Symbols,	24
V.	Geology of Hyderabad,	97
VI.	Section of St. Peter's Church,	193
VI.	(bis) Buddhist image from Tagoung, &c.	241
VII.	Nisaëtus Nipalensis,	227
VIII.	Geology of Moulmein,	280
IX.	Facsimile of inscriptions at Chunar and Kemaon,	342
X.	Ditto of inscriptions at Wara and Moulmein,	340
XI.	Mastodon Angustidens, folded,	296
XII.	Large Map of Taxila, folded,	469
XIII.	(Caret.)	
XIV.	Diurnal motion of the Barometer,	816
XV. XVI. XVII. XVIII. XIX.	Fossil Rhinoceros of the Sub-Himálayas,	504
XX.	Buddhist sculpture from the Panjab,	482
XXI.	Curves of maximum Depression,	408
XXII.	——— depression under varying pressure,	411
XXIII.	Vossia procera,	572
XXIV.	Zizania and Potamochloa,	570
XXV.	(Caret.)	
XXVI.	Cultrunguis Flavipes,	364
XXVI.	Seal from Asirgarh—Bronze head,	486
XXVII.	Fossil Carnivora of the Sub-Himálayas,	580
XXVIII. XXIX.	Ceylon inscriptions,	554 and 556
XXX.	Tridents in Garhwal with inscriptions,	486
XXXI.	Inscription at Buddha Gaya,	657
XXXII.	Bhitari inscription (will appear in Vol. VI.)	
XXXIII.	Inscription in Asiatic Society's museum,	724
XXXIV.	Seoni inscription, two plates,	726
XXXIV.	Fossil Sus of Sub-Himálayas,	661
XXXV.	(bis) Miscellaneous Bactrian Coins,	548
XXXVI.	Statue of Silenus,	567
XXXVI.	(bis) Connection of Mithraic with Hindu Coins,	639
XXXVIII.	Canouj coins,	649
XXXIX.	Second series continued,	654
XL.	Fossil Mastodons of Siwaliks,	761
XLI.	Map of Richardson's route,	605
XLII.	(Caret.)	
XLIII.	Development of Pollen, folded,	738

Page

XLIV. Names of Places in Burmese, ... 601
XLIV. (bis) Teeth of fossil Sus, ... 664
XLV. (Caret.)
XLVI. Bactrian Coins, ... 720
XLVII. Fossil Quadrumana of Sub-Himálayas, ... 740
XLVIII. Arabic Nautcial instruments,..... 784
XLIX. Maldive Alphabet, ... 794

Owing to the continual postponement of papers this year, and to the lithographer having numbered his plates without reference to the engravings, many numbers have been given twice over, and the whole occur very irregularly. They will be found, however, correctly placed in the monthly numbers, with exception of Cultrunguis flavipes, which must be shifted to page 364—and of the plate circulated with the February Journal which belongs to the preceding volume, Pl. LIV., along with the corrected catalogue of plates of that volume.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 49.—January, 1836.

I.—*Second Memoir on the Ancient Coins found at Beghrám, in the Kohistán of Kábul.* By Charles Masson.

I had the pleasure last year to submit a Memoir on the coins discovered at *Beghrám*, and now beg to offer a second, containing the results of my collection of the present year from the same place: the observations which these coins suggest I shall preface by a few remarks, tending to illustrate the locality of the spot where they are found, as well as some other points connected with it.

I shall also submit, in this Memoir, the results of discoveries in other places, made during the year, so far as they refer to numismatology; in the hope to contribute to farther elucidation of the history of the countries from which I write.

The *dasht* or plain of *Beghrám* bears N. 15 E. from the modern city of *Kábul*, distant by computation eighteen ordinary kos; and as the line of road has few sinuosities or deflections, the direct distance may probably be about twenty-five British miles. It is situated at the south-east point of the level country of the *Kohistán*, in an angle formed by the approach of a lofty and extensive mountain range, radiating from the superior line of the *Caucasus* on the one side, and by the inferior range of *Síáh Koh* on the other. The former range separates the *Kohistán* from the populous valley of *Nijrow*, and the latter, commencing about 15 miles east of *Kábul*, gradually sinks into the plain of *Beghrám*. East of the *Síáh Koh* is a hilly, not mountainous, tract, called *Koh Safí*, which intervenes between it and the extensive valleys of *Taghow*. Through the open space extending from west to east, between these two hill ranges, flows the river formed by the junction of the streams of

Ghorband and *Panjshír*, and which forms the northern boundary of the site of *Beghrám*. Through this space also leads the high road from the *Kohistán* to *Nijrow*, *Taghow*, *Laghmán*, and *Jelálabád*. The *dasht* of *Beghrám* is comprised in an extensive district of the *Kohistán* called *Khwojeh Keddrí;* to the north, the plain has an abrupt descent into the cultivated lands and pastures of the *Baltú Khele* and *Karindat Khán Khele* families, which at the north-western point interpose between it and the river for the extent of perhaps a mile, or until the river leaves the base of a singular eminence called *Abdullah Búrj*, which from the vast mounds on its summit was undoubtedly an appurtenance of the ancient city. East of this eminence another small space of cultivated lands, with two or three castles, called *Káráhíchí*, interposes between a curvature in the direction of the abrupt boundary of the *dasht*, and the direct course of the river; east of *Káráhíchí* rises a low detached hill, called *Koh Butcher*, which has an extent eastward of about a mile and half, intruding for that distance between the level *dasht* and the river; at the eastern extremity of *Koh Butcher* is one of those remarkable structures we call *topes*. Parallel to *Koh Butcher*, on the opposite side of the river, are the castles and cultivated lands called *Muhammad Rákhi*, and beyond them a sterile sandy tract gradually ascending to a celebrated hill and *Zeárat*, named *Khwojeh Raig Rawán*, and thence to the superior hill range before mentioned; east of *Koh Butcher*, the level plain extends for about a mile, until the same character of abrupt termination sinks it into the low lands of *Júlghar*, where we find numerous castles, much cultivated land, and as the name *Júlghar* implies, a large extent of *chaman* or pasture. The lands of *Júlghar*, to the east, from the boundary of the *dasht* of *Beghrám*, to the south, its boundary may be considered the stream called the river of *Koh Damán*, which after flowing along the eastern portion of *Koh Damán*, and receiving what may be spared after the irrigation of the lands from the streams of *Shakr Darrah*, *Beydak*, *Tugah*, *Istalif*, &c. falls into the joint river of *Gharband* and *Panjshír* at a point below *Júlghar*. Beyond the river of *Koh Damán*, a barren sandy soil ascends to the skirts to the *Síáh Koh* and *Koh Safí*. Among the topographical features of the *dasht* of *Beghrám* may be noted three small black hills or eminences, detached from each other, which in a line, and contiguous to each other, arise from the surface of the soil a little north of the river of *Koh Damán*. To the west of *Beghrám* are the level lands of *Mahíghír;* at the north west angle of the plain is the small village of *Killah Boland*, where reside about seven Hindú traders, some of them men of large capitals; and at the south-west angle are three castles called *Killah Yezbáshí*, distant from *Killah Boland* about four miles. From *Killah Boland* to *Júlghar* a

distance occurs of four and half to five miles; from *Júlghar* to the skirts of the *Síáh Koh*, about six miles; from the termination of *Koh Síáh* to *Killah Yezbáshí* may be also about six miles, and from *Killah Yezbáshí* to *Killah Boland* about four miles, as just noted. The whole of the intermediate space between these points, and even beyond them to the south-east and south-west, is covered with fragments of pottery, lumps of dross iron, &c. and here are found the coins, seals, rings, &c. which so much excite our curiosity. Notwithstanding the vast numbers of such reliques discovered on this extent of plain, we have hardly any other evidence that a city once stood on it, so complete and universal has been the destruction of its buildings. But in many places, we may discover, on digging about the depth of a yard, lines of cement, which seem to denote the outlines of structures, and their apartments; on the edge of the plain, where it abruptly sinks into the low lands of *Báltú Khele*, from *Killah Boland* to *Káráhíchí*, is a line of artificial mounds; on the summit of the eminence called *Abdullah Búrj* are also some extraordinary mounds, as before noted, and contiguous to the south is a large square described by alike surprising mounds; on one side of this square, the last year, a portion sank or subsided, and disclosed that these mounds were formed or constructed of huge unburnt bricks, two spans square and one span in thickness. This circumstance also enabled me to ascertain that the original breadth of these stupendous walls, for such we must conclude them to have been, could not have been less than sixty feet; probably much more. Among the mounds near *Killah Boland* is a large tumulus, probably a sepulchre, which appears to have been coated with thin squares of white marble; and near it, in a hollow formed in the soil, is a large square stone, which the Muhammedans call *Sang-Rustam*, or the stone of RUSTAM, and which the Hindús, without knowing why, reverence so far as to pay occasional visits to it, light lamps, and daub it with *Sindúr* or red lead. In the Muhammedan burial ground of *Killah Boland* is a fragment of sculptured green stone, made to serve as the head-stone to a grave; about four feet thereof is above ground, and we were told as much more was concealed below; this is a relique of the ancient city, and we meet with another larger but plain green stone, applied to a similar purpose, in a burial ground called *Shahídan*, or the place of martyrs, under *Koh Butcher*. In a *Zeárat* at *Charíkár* is also a fragment of sculptured green stone; and it is remarkable that all the fragments of stone which we discover, and which we may suppose to have reference to the ancient city, are of the same species of colored stone. The traditions of the country assert the city of *Beghrám* to have been overwhelmed by some natural catastrophe, and while we vouch not for the fact, the entire demolition of the

place, with the fact of the outlines of buildings discoverable beneath the surface, seem not to discountenance the tradition. It is not however improbable that this city, like many others, may owe its destruction to the implacable rage of the barbarous and ruthless GENGHIZ, who like ATTILA described himself as the "*Ghazb Khudá*," or "Scourge of God." That it existed for some time after the Muhammedan invasion of these countries is evidenced by the numerous coins of the Caliphs found on its site. That it ceased to exist at the period of TIMU'R's expedition into India, we have negative proof furnished by his historian SHERIFUDDIN, who informs us, that TIMU'R, in his progress from *Anderab* to *Kábul*, encamped on the plain of *Baran* (the modern *Bayan*, certainly) and that while there, he directed a canal to be cut, which was called *Mahíghír*, by which means, the country, before desolate and unproductive, became fertile and full of gardens. The lands thus restored to cultivation, the conqueror apportioned among sundry of his followers. The canal of *Mahíghír* exists at this day, with the same name it received in the time of TIMU'R. A considerable village, about one mile west of *Beghrám*, has a similar appellation. This canal, derived from the river of *Ghorband*, at the point where it issues from the hills into the level country, irrigates the lands of *Báyán* and *Mahíghír*, and has a course of about ten miles. Had the city of *Beghrám* then existed, these lands immediately to the west of it, would not have been waste and neglected, neither would TIMU'R have found it necessary to cut his canal, as the city when existing must have been supplied with water from the same source, that is, from the river of *Ghorband;* and from the same point, that is, at its exit from the hills into the level country; and the canals supplying the city must have been directed through these very lands of *Báyán* and *Mahíghír*, which TIMU'R found waste and desolate. The courres of the ancient canals of *Beghrám* are now very evident, from the parallel lines of embankments still to be traced. The site of *Beghrám* has, to the north, the river formed by the junction of the *Ghorband* and *Panjshír* streams, and to the south, the river of *Koh Damán;* but neither of these rivers are applicable to the irrigation of the circumjacent soil, the former flowing in low lands, perhaps one hundred and fifty feet below the level of the plain, and the latter scantily furnished with water flowing in a sunken bed. It may be farther noted, with reference to TIMU'R's colonization of *Mahíghír*, that the inhabitants of the district of *Khwojeh Keddrí*, while forgetful as to whom their forefathers owed their settlement in this country, acknowledge their *Turki* descent, and alone of all the inhabitants of the *Kohistán* speak the *Turki* language. We might expect to detect a notice of *Beghrám* in the Arabian records of the early caliphs, in the histories of the Ghaznavi emperors, and in those of GENGHIZ KHÁN.

That *Beghrám* was once a capital city is evidenced by its *tope*, a sepulchral monument of departed royalty; while a second, situated in *Tope Darah*, about nine miles west, may probably be referred to it, as may perhaps a third found at *Alisahí*, at the gorge of the valley of *Nijrow*, distant about 12 miles east. The appellation *Beghrám* must also be considered indicative of the pre-eminence of the city it characterizes; undoubtedly signifying the chief city or metropolis. About three miles east of *Kábul*, we have a village and extensive pasture retaining this name, which indicates the site of the capital in which KADPHIS and his lineage ruled, and whose topes we behold on the skirts of the neighbouring hills. Near *Jelálábád*, a spot called *Beghrám*, about a mile and half west of the present town, denotes the site of the ancient *Nysa;* or, if the position of that city admit of controversy, of *Nagara;* its successor in rank and consequence. Near *Pesháwar* we have a spot called *Beghrám*, pointing out the site of the original city; and that this epithet of eminence and distinction was continued, up to a recent date, to the city of *Pesháwer*, we learn from BA'BER and ABUL FAZL.

We have indications in the *Kohistán* of *Kábul* of two other ancient cities, which were undoubtedly considerable ones, but which we cannot suppose to have rivalled *Beghrám* in extent or importance. The principal of these is found in *Perwan*, about eight miles N. 19 W. of *Beghrám*, and consequently that distance nearer to the grand range of Caucasus, under whose inferior hills it is in fact situated. The second is found at *Korahtass*, a little east of the famed hill, and *Zeárat Khwojeh*, *Raig Ruwan*, distant from *Beghrám* about six miles N. 48 E. There are also many other spots in various parts of the Kohistán which exhibit sufficient evidences of their ancient population and importance; but these must be considered to have been towns, not cities. In the valley of *Panjshír* we have more considerable indications, and we are enabled to identify three very extensive sites of ancient cities; but which, from the character of the country, and the limited extent of its resources, we can hardly suppose to have flourished at the same epoch. In the *Koh Damán* of *Kábul*, or the country intervening between that city and the Kohistán, we discover two very important sites, which unquestionably refer to once capital cities: both occur in a direct line from *Beghrám* to *Kábul*, under the low hill ranges which bound *Koh Damán* to the east, and contiguously also east to the river of *Koh Damán;* the first commences about eight miles from *Beghrám*, and is known by the name of *Tartrung-Zar;* the second is about the same distance farther on, and has no particular name, but is east of the seignorial castles of *Luchú Khan*, and the village of *Korinder:* at this site we find a tope, an indubitable evidence of royalty, and connected with it is a stupendous

artificial mound on the west bank of the river, constructed with elaborate care: the base appears originally to have been surrounded with a magnificent trench, supplied by the stream with water. Here no doubt was some important structure, a palace or citadel. At this day the summit is crowned with dilapidated mud walls of modern construction, and the spot is known by the name of *Killah Rájput*. In the district of *Ghorband*, west of the great hill range, which radiating from the *Hindú Kosh*, or Caucasus, forms the western boundary of *Koh Damán*, we have very many important vestiges of antiquity, both in the principal valley and in its dependencies, particularly in one of them named *Fendúkistán*: we have reasons to believe that coins are found there in considerable numbers, and that there are some interesting mounds; but as we have not seen this spot, we refrain from speculating upon its character.

We have thus enumerated the principal ancient sites of cities in *Koh Damán* and *Kohistán*, both as shewing the former importance and illustrating the capabilities of these fine countries, and as exhibiting the fluctuations, in ancient times, of the seat of royalty in them. *Beghrám*, *Perwan*, *Tartrung-Zar*, and *Killah Rájput* have no doubt in succession been the abodes of sovereigns, as have most probably *Panjshír* and *Korahtass*. Our minuteness may moreover be excused, because in this part of the country we expect to detect the site of *Alexandria ad Caucasum*, or *ad calcem Caucasi*. It may be remarked, with reference to the sites of *Beghrám* and *Perwán*, that the former is called by the Hindús of the country '*Balrám*,' and is asserted by them to have been the residence of Rája BAL; the latter they call *Milwán*, and assert to have been the capital of Rája MILWAN. MILWAN may be a Hindú appellation, but it has been also assumed by Muhammedans.

We have it not in our power to consult the ancient authorities, who have noticed *Alexandria ad Caucasum*, or probably its site might have been definitely fixed; but when we know that it was also called *Naulábi* or *Nilábi*, from being situated on or near the river *Naulábi* or *Niláb*, we have no difficulty in seeking for its position, being acquainted with the geographical features of this part of Asia. The name *Nilábi* could only have been conferred on the river of *Ghorband*, or on that of *Panjshír*, or to both, after their confluence; in the latter event, we are brought to the site of *Beghrám* without the chance of error. The rivers of *Ghorband* and *Panjshír* unite at a spot called *Tokchí*, bearing north a little west of *Beghrâm*, distant about a mile and half or two miles, and near the place called *Inchór*, which is inserted in the map accompanying the Honorable Mr. ELPHINSTONE's work. *Inchór* is a solitary castle, picturesquely seated amid a large extent of fine *chaman* or pasture land. From its source the river of *Ghorband*, which is also that of *Bamián*,

has a greater extent of course than that of *Panjshír;* but the latter is the more considerable stream. At the point where the river of *Panjshír* issues from the hills into the level country of the *Kohistán,* is a spot now called *Niláb;* also at the very site of *Beghrám* after its union with the *Ghorband* river, the united stream has the same name, in both instances derived from the great depth of the water, and its consequent limpid and blue appearance. In the valley of *Ghorband* is a spot called *Niláb,* which now by some contradiction is conferred upon the land adjacent to the river, and not upon the river itself. I incline to consider the river of *Ghorband* to be the *Nilábi* of our ancient authors, and if it be found that the *Naulábi* of PTOLEMY, STRABO, or PLINY, the writers who have probably mentioned it, be conducted by *Drapsaca* or *Drashtoca,* which may be concluded to be the modern *Bamián,* we can have no doubt of the fact, and the merit of being considered the site of Alexandria ad Caucasum, or ad calcem Caucasi, can only be contested by two sites, that of *Niláb,* in the valley of *Ghorband,* and that of *Beghrám.* Near *Niláb,* in *Ghorband,* we find the remains of a most stupendous fortress; but however valuable as a military post, it does not seem calculated to have been the site of a large city. *Beghrám,* on the contrary, possesses every advantage of situation, and would in these days, if revived, bid fairer to realize its pristine prosperity, than any other site in these countries. With the term *Alexandria ad calcem Caucasi,* the situation of *Niláb* would precisely agree, and we learn also that the city so called was near the cave of PROMETHEUS. This appears to have been justly located by WILFORD, near the pass of *Shibr;* and we find at *Ferinjal,* a dependency of *Ghorband,* between it and *Bamián,* or near *Shibr,* a most extraordinary cave, which we would fain believe to be that of PROMETHEUS. With the term *Alexandria ad Caucasum,* the site of *Beghrám* would sufficiently coincide; while its distance from the cave of Ferinjal, or that of PROMETHEUS, is not so great as to violate propriety in its being termed contiguous, while its propinquity to the base of Hindu Kosh, or Caucasus, would seem to justify its being entitled *Alexandria ad calcem Caucasi.* That ALEXANDER established not merely a military post, but founded a large city, we ascertain, when we learn from CURTIUS, that he peopled it with no less then seven thousand menials of his army, besides a number, of course considerable, but not mentioned, of his military followers, and are distinctly informed, that the city in question became a large and flourishing one. No doubt, if this part of Asia were to come under European control, the re-edification of *Beghrám* would be deemed a necessary measure, for a considerable city at this spot would not only provide for the due submission of the half-obedient

tribes of the *Kohistán*, but would secure the allegiance of those absolutely in rebellion or independence, as of *Panjshir*, *Nijrow*, *Taghow*, &c.

It is impossible to cast a retrospective view over the regions of *Afghánistán* and *Turkistán*, to behold the cities still in existence, and the sites of such as have yielded to the vicissitudes of fortune, which owe and owed their foundation to ALEXANDER THE GREAT, without paying the tribute of homage and admiration to his genius and foresight. Above twenty centuries have elapsed, since the hero of Macedon marched in his triumphant career from the shores of the Bosphorus to the banks of the Hyphasis, subjecting the intermediate nations, but rendering his conquests legitimate, by promoting the civilization and prosperity of the vanquished. A premature death permitted not posterity to wonder at the prodigy of an universal monarchy, which he alone of all mankind seemed talented to have erected and maintained. No conqueror had ever views so magnificent and enlightened, and none ever left behind him so many evidences of his fame. Of the numerous cities which he founded, many are at this day the capitals of the countries where they are found; and many of those no longer existing would assuredly be revived, were these parts of Asia under a government desirous to effect their amelioration. The selection of *Mittun* by the British Government of India for their mart on the Indus, while the most eligible spot that could have been chosen, was also a tribute of respect to the memory of the illustrious ALEXANDER; for there can be no doubt that *Mittun* indicates the site of the *Alexandria* that he founded at the junction of the united streams of the *Panjáb* with the Indus, and which he predicted, from the advantages of position, would become a large and flourishing city. It may be that *Mittun* under British auspices may realize the prophecy applied by the hero to his Alexandria.

To return from this digression to the question of the site of *Alexandria ad Caucasum* or *ad calcem Caucasi*, we can only refer it to two spots, *Niláb* in *Ghorband*, and *Beghrám*: I incline to prefer the latter, from the superiority of its local advantages, and from the certainty of its having been a large and flourishing city, as Alexandria is represented to have become. In favor of *Niláb* may perhaps be adduced the itinerary of DIOGNETES and BŒTON, the surveying officers of ALEXANDER, as preserved by PLINY. We there find the measured distance from the capital of *Arachosia* to *Ortospanum* stated to be 250 miles, and from *Ortospanum* to *Alexandria*, 50 miles. The capital of *Arachosia* was unquestionably in the vicinity of the modern *Kándahár*, and *Ortospanum*, although by some considered *Ghazni*, may safely be referred to *Kábul*, when we find in PTOLEMY that it was also called *Cabura*, the first approximation to the present name

Kábul, which we detect in our ancient geographers. The distance between the modern cities of *Kábul* and *Kándahár*, agreeably to admeasurements made under the *Chaghátai* Emperors of India, is ninety-two *Jeríbi koss*, or nearly 210 British miles; the miles of PLINY are no doubt Roman ones, which were, I believe, a little less than our British statute ones: this slight difference will not however compensate for the excess in the distance fixed by ALEXANDER'S officers; but there are reasons to suspect that the ancient capital of Arachosia was situated some eighteen or twenty miles west of the modern *Kandahár*, at the base of a hill called *Panchvahí*, where traditions affirm a large city once flourished, and of which there is abundant proof in the huge mounds to be observed there. The ancient city of *Kábul*, which I infer to have been *Ortospanum*, was seated also some three or four miles east of the modern one; the distances here gained, with the difference between British and Roman miles on two hundred and fifty of the latter, (if they be, as above assumed, less,) will reconcile the measurements of the officers of ALEXANDER with those of the Chaghátai Emperors, and we can have little doubt but that Ortospanum is represented by the present *Kábul*. From *Kábul* to *Beghrám*, the distance is not certainly more than twenty-seven British miles; but from *Kábul* to *Niláb* of *Ghorband*, the distance is nearly, if not fully, fifty miles, coinciding with the account of DIOGNETES and BŒTON. It may however be observed, that different copies of PLINY have in this instance various numbers, so that we feel perplexed to select the genuine ones; fifty I believe to be the least mentioned, and I have calculated with it, supposing it the more probable one. The same itinerary gives the distance between *Alexandria ad Caucasum* and *Peucalaotis*, stated to be 227 Roman miles: this latter place has generally been located near the modern *Pesháwar;* from *Kábul* to *Pesháwar* are estimated 112 ordinary koss, which, calculated at one mile and half each, yield nearly 170 miles, *Beghrám* will be nearly equidistant from *Pesháwar* with *Kábul*, therefore the distance noted in the itinerary will coincide rather with the locality of *Niláb*, which may be about 30 British miles from *Beghrám*, and consequently 200 or more British miles from *Pesháwar*, equivalent perhaps to 227 Roman miles. But I do not feel confident that *Peucalaotis* has been justly referred to the site of *Peshawar*. It appears to have been the name of a province, the capital of which was *Peucela;* in these terms we detect a considerable affinity to the modern appellation *Puekoli*, applied to a district with capital of the same name east of the *Indus*, and above *Attock*, which in ancient times included a considerable territory west of the Indus. It is not certain that ALEXANDER visited the immediate vicinity of *Peshawar*, although HEPHÆSTION will have done

so; and it is probable that he crossed the *Indus* above *Attock*, or at a point in the modern district of *Puekoli*, perhaps the ancient *Peucolaotis*. A similarity of denomination may not always be depended upon, but when combined with other accordances, it becomes, as D'ANVILLE expresses it, "un moyen de convenance." I shall close my speculations on the site of *Beghrám*, by remarking, that ALEXANDER in his march from *Bactra* to *Alexandria ad Caucasum* will have arrived at it by the route of *Bamián* and *Shibr*, because ARRIAN informs us, that he passed *Drapsaca* on the road, which can hardly be mistaken for the former of those places. ALEXANDER crossed the *Hindú Kosh* or *Caucasus* in the month of May; when, supposing the seasons and climate of these countries to have been the same as at present, any other route over that mountain range was impracticable. The route from *Bamián* to *Ghorband* is passable to *káfilas* at all seasons of the year, and is no doubt the high road; but it has been closed during the last twenty-five years, by the insurrection of the *Shaikh Alí Hazárehs*, who inhabit the small extent of country between *Ghorband* and *Shibr*. The route of *Bamián* will have conducted ALEXANDER either to *Niláb* or *Beghrám*; and these observations would have been unnecessary, had it not been supposed by some that his starting place was *Anderáb*: this assumption does not however seem warranted, and if grounded on the route that TIMU'R followed, it should have been recollected that the Tartar conqueror crossed the Indian *Caucasus* in the month of July.

It had been my intention this year to have secured every coin of every description that should be picked up from the *dusht* of *Beghrám*, and this purpose would probably have been effected, had I not been compelled to be absent at *Jelálábád*. A young man was however despatched thither, with recommendatory letters to my friends in the *Kohistán*, and to him was confided the collection of all he might be able to procure. On my eventually reaching *Kábul*, the young man joined with 1320 coins, from the appearance of which it was evident he had selected, and not, as ordered, taken all that were offered. It also appeared, that in consequence of the distracted political state of the *Kohistán* in the spring, the *Afghán* pastoral families had not as usual visited the plains of *Beghrám* at an early season. In the autumn, moreover, from apprehensions of a rising in this part of the country, the Afgháns sent their flocks to the *Safí* hills, the persons tending which are the principal finders of these coins. Under these unfavorable circumstances, I twice repaired to *Beghrám*, and at various intervals despatched my young men, and the total result of our collection this year was five silver and 1900 copper coins. These are of course generally

of the same description and types as those illustrated in my Memoir of last year; but a few were procured of novel types, and a few altogether new, among which one or two may be deemed valuable. It is my object in this Memoir to detail these fresh discoveries, and to offer such remarks upon them, and the topics they involve, as may arise upon their consideration. My stay at *Jelálábád* was, during the season of the year, unfavorable for the collection of coins; yet, independently of those extracted from topes, were procured 248 copper coins, among which two or three are novel ones, to be noted in their place.

Subsequent to my arrival in *Kábul*, I purchased in the bazár there, six golden, 176 silver, and 142 copper coins: some of these are important ones. I had also the fortune to secure a large parcel of silver Bactrians, a deposit discovered in the *Hazárehját:* among these are coins of a type likely to excite some interest.

The coins extracted from the various topes opened this year, may also be deemed interesting, from the positive connection they have with the monuments enclosing them; and valuable, from their superior preservation, having in many instances been inserted new; and presenting specimens as perfect and intelligible as we may hope to procure.

I shall observe in this Memoir nearly the order adopted in my preceding one, with reference to classification and the succession of series, making however such modifications and distinctions as further discoveries seem to warrant.

General Observations.

Class, Grecian Series, No. 1.—*Coins of the recorded Kings of Bactria.*

As during the last year, we are without any evidence of Theodotus I. and Theodotus II., the two first Bactrian kings; and that their sway was confined to Bactriana proper, or the regions north of the Indian Caucasus, is confirmed by the non-discovery of their coins at *Beghrám.* This fact can scarcely be doubted, when we have historical evidence, that a distinct and powerful kingdom existed, under Sophagasenus, in the Paropamisan range, at the time of the expedition of Antiochus Magnus.

This year has yielded five copper coins of Euthydemus, the third Bactrian king; one was procured at *Jelálábád;* the four others from *Beghrám:* their discovery seems to prove the extension of this monarch's rule south of the Caucasus—a fact countenanced by probability, and the slight historical evidences we have of him. The solitary coin found at *Jelálábád* does not afford proof positive that Euthydemus governed there also, both because there is no certainty where coins purchased in bazárs were produced; and it is not impossible but that it may have found its way there from *Beghrám,* as the *Afghán* shepherds, resident on its plain during the summer, migrate to *Lughmán* and the vicinity of *Jelálábád,*

during the winter; and the few coins they may bring with them, they disperse among the dealers in the small towns, as their trifling wants of oil, tobacco, &c. may induce them. EUTHYDEMUS being denominated of Magnesia, it may be questioned, in what manner he ascended the Bactrian throne, whether by the right of lawful succession, or of successful usurpation. At all events, he appears to have been a sovereign of great talents, worthy of his exalted rank.

Of APOLLODOTUS, besides a large number of copper coins, we have this year procured five silver quadrangular coins, the type varying from those already known.

Of the celebrated MENANDER, this season has afforded us some copper coins of novel types, and a large number of silver drachmas and hemidrachmas, presenting alike some varieties in the types: we found not one of this prince's coins at *Jelálábád*, where we indeed met with two of APOLLODOTUS, but decline to draw inferences from solitary specimens.

When we consider the coincidences observable on the coins of MENANDER and APOLLODOTUS, some of which have even the same figures on the reverses with the resemblance of their features; and when we find them conjointly commemorated by ARRIAN and TROGUS, the only two ancient authors who have recorded the latter's name, we feel every inclination to conjecture that the ties of consanguinity must have connected them. As APOLLODOTUS is previously named by both these authorities, he may be supposed to have been the father, or perhaps elder brother, of MENANDER; and that he preceded the latter in sovereignty would seem nearly certain, being borne out by every circumstance attending the coins we discover. That the reigns of both these princes was of considerable duration is evidenced by the numerous coins we find, and by the variety of types they exhibit, proving them to have been struck at different periods. The busts of APOLLODOTUS on the two or three coins hitherto found, which exhibit them, have an extremely youthful appearance; and the portraits of MENANDER display the transition from youth to manhood. That APOLLODOTUS reigned in *Bactriana* proper, we doubt with BAYER, although his pretensions have been advocated by Colonel TOD. That he was the son of EUTHYDEMUS, we think certain, and that he was the father or elder brother of MENANDER, we think probable, and assuredly his predecessor; that he governed in the provinces south of Bactriana is certain, and there, according to the suggestions of SCHLEGEL, I incline to locate his original kingdom and that of MENANDER; that this kingdom may have included some of the provinces of Bactriana Latior, or the regions immediately north of the Caucasus, is very probable, and would justify its monarchs' being styled kings of Bactria by their historians. How far this kingdom

extended eastward, we may not be able now to determine; but the non-discovery of the coins of APOLLODOTUS at *Jelálábád* (holding two or three specimens procured from bazárs, but found no one knows where, no exception to the remark) seems to prove that in his time an independent power must have existed there: this receives farther proof when we meet not there with the coins of his successor MENANDER, which abound so numerously at *Beghrám*. As APOLLODOTUS certainly invaded India, we may suppose him, without prejudice to the kingdom of Nysa, to have marched by the route of *Khouram*, *Bannú*, and *Multán* to the *Hyphasis*, on exactly the same route that was followed by TIMU'R; and in corroboration thereof, we find him brought to the *Hyphasis*, where he re-edified the city of *Sangála* under the name of *Euthydemia*. There can be little doubt but that *Sangála* owed its revival to APOLLODOTUS. That it sprang into new consideration under the auspices of a son of EUTHYDEMUS, can scarcely be questioned, and every circumstance seems to point out that son to have been APOLLODOTUS. The coin discovered by Dr. SWINEY, which bears the epithet *Philopater*, not a little confirms this fact. MENANDER, whether the son or brother of APOLLODOTUS, seems fairly entitled to be considered his successor. This prince followed up the Indian conquests, while he preserved his dominion in the provinces south of Bactriana; but these latter, on his decease, probably will have been assumed by EUCRATIDES the I., or the Great, king of Bactriana proper. MENANDER, we know, was interrupted in his warlike operation by death; but when, and where, is not recorded by history, which has been alike faithless to the actions of one of the most illustrious sovereigns that ever held a sceptre.

The coins of EUCRATIDES I., so numerously found at *Beghrám*, are not to be discovered at *Jelálábád* any more than those of APOLLODOTUS and MENANDER, considering always a single specimen no evidence that coins of that species were once current there, but rather that they were not: this circumstance farther substantiates the existence of an independent monarchy at Nysa, and that it was sufficiently powerful to maintain its integrity inviolate; for EUCRATIDES was no doubt a warlike and ambitious prince.

Before adverting farther to EUCRATIDES, we may be excused in offering two or three observations as to DEMETRIUS, a recorded son of EUTHYDEMUS, and employed by him in his negociations with ANTIOCHUS. If he stand simply recorded as a son, it neither proves that he was the elder son, although probable, or, that he was the only son. As it was probably by his means that EUTHYDEMUS subverted the kingdom of GAJ, in the Paropamisan range—an event which could not have occurred until the close of the reign of EUTHYDEMUS; as SOPHAGASENUS, the father

of GAJ, was his cotemporary at the period of the expedition of ANTIOCHUS, we may suppose that DEMETRIUS retained the sovereignty of the countries he conquered, and extended his conquests in *Arachosia*, now thrown open to his arms. Accordingly, in a route of ISIDORUS of Charox the name of a city, *Demetrias* of *Arachosia*, occurs, which would seem referred with justice by SCHLEGEL to the son of EUTHYDEMUS, and which points out the direction of his empire. Without power of reference to the route of ISIDORUS, in which the name *Demetrias* occurs, we may observe, should it be found in any of those from the western provinces, as *Ariana*, &c. to the eastern ones on the Indus, we should incline to place it in the valley of the *Turnek*, between *Kandahár* and *Mokur*, in the country now inhabited by the *Thokí Gulzyes*, where we have evidences that a powerful capital once existed, which may have been that of DEMETRIUS. The attack of DEMETRIUS, or his son, of the same name, upon EUCRATIDES may have arisen from the irksomeness naturally to be felt at the vicinity of a powerful and ambitious prince, who, by the extension of his empire, had sufficiently evinced his desire of aggrandizement. History, which records DEMETRIUS as the aggressor in this war, also records that EUCRATIDES had possessed himself of *Ariana*, and we find that he was also master of the regions south of the Indian Caucasus, thus pressing upon the confines of *Arachosia* at the two extreme points of east and west. Aggression on the point of DEMETRIUS may therefore have been a measure of necessity, or even of prudence, it being certainly more politic to aggress than to be reduced to repel aggression. It has not been our fortune to meet with a coin of DEMETRIUS, or to be acquainted with the type of that procured by Baron MYENDORFF at Bokhárá; but unless the reverse be decidedly Bactrian, a bust adorned with the skin of an elephant would not be sufficient evidence, in our estimation, to allow its appropriation to the son of EUTHYDEMUS. I have a letter from M. MARTIN HONIGBERGER, from *Bokhárá*, by which I learn that he has also procured there a coin of DEMETRIUS, but he has not described its character. It may be noted that these two coins of DEMETRIUS, the only ones, we believe, hitherto discovered*, have been elicited at *Bokhárá*. Among the coins obtained by M. HONIGBERGER at *Bokhárá*, and which he thought worthy of enumeration, probably as being both Greek and silver ones, are transcribed in his memorandum,

1 Vasileos Antiochu.
1 Vasileos Dimitriu.
1 Vasileos Megalu Hiokraksu.
3 Vasileos Euthidimu.
5 Eucratides.

* There is a beautiful little Demetrius in the Ventura collection; see vol IV.—ED.

As DEMETRIUS did not succeed his father in Bactriana proper, and reasons may be alledged for suspecting that APOLLODOTUS also did not, the question naturally arises, to whom are we to assign the empire of *Bactriana* in the interval between the demise of EUTHYDEMUS and the accession of EUCRATIDES—a space of fourteen years according to the table of SCHLEGEL. I have mentioned the discovery of a parcel of *Bactrian* drachmas and hemi-drachmas in the *Hazárehját*, which we purchased from a *Hindú* at *Charrukar*, who some three years since received them from a *Hazaureh*. I have not yet been able to ascertain the spot, or under what circumstances these coins were found. The parcel, 120 in number, comprised seven quadrangular silver coins of APOLLODOTUS, 108 silver coins of MENANDER, and five silver coins of ANTIMACHUS. The day preceding that on which this parcel of coins came into my possession, I received from the dushts of *Beghrám*, a silver coin of the same last-named prince, ANTIMACHUS. The beauty of the coins of ANTIMACHUS, the excellence of their execution and designs, with the purity of the Greek characters of the legend, allow us not to place this prince subsequent to EUCRATIDES, whose coins in these particulars they surpass. Among 5000 or more copper coins, procured from the dasht of *Beghrám*, we have not discovered one of ANTIMACHUS, and the detection of a single silver coin does not seem to afford evidence that he ruled there, when the absence of his copper coins seem to prove that he did not. Where then must he be placed? We feel the inclination to conjecture him to have been the son and successor of EUTHYDEMUS in Bactriana proper. The reverses on the coins of APOLLODOTUS and MENANDER are not strictly Bactrian, or in relative connection with those we discover on those of the undoubted kings of Bactriana, EUTHYDEMUS and EUCRATIDES; the horseman in charge on the reverses of those of ANTIMACHUS is so, and forms the link between the horse at speed on the coins of EUTHYDEMUS, and the two horsemen in charge on those of EUCRATIDES. The monograms on the coins of ANTIMACHUS coincide with some on the coins of MENANDER, and if we can suppose them to be numerical ones (which however I affirm not to be certain) suggest the opinion that they were cotemporaneous princes, it being possible both were deduced from a common era. We feel perplexed when we are only allowed by the table of SCHLEGEL, an interval of fourteen years, and when we have three princes who may claim to have reigned between EUTHYDEMUS and EUCRATIDES; it may however be suspected that the accession to sovereignty of the latter, unless historically fixed, is antedated ten years. No one of the very many coins of this prince we meet with, presents a monogram clearly numerical, which yields a higher number than 85; while the highest number

found is 108, as preserved on the silver didrachma in the Earl of PEMBROKE's cabinet, noted by PINKERTON and indicating the close of his reign. Neither do the features of EUCRATIDES, as preserved on his coins, exhibit the striking variation of youth to manhood observed on those of MENANDER, and do not authorize us to allow so long a reign as 35 years. I incline to date his accession at the epoch 84, of the Bactrian æra, and to fix the duration of his reign to 25 years: thus gaining between it and the demise of EUTHYDEMUS an interval of twenty-four years; but even this increased interval does not suffice for the reigns of APOLLODOTUS, MENANDER, and ANTIMACHUS. Those of the two former, particularly of MENANDER, were certainly of some duration, as evidenced by their numerous coins of various types discovered. APOLLODOTUS, from the youthful bust displayed on his coins, may be inferred to have died young; but MENANDER, we think, must be allowed to have attained mature manhood, or the age of forty to forty-five years: while his numerous coins, shewing the traits of extreme youth, seem to attest his accession to sovereignty at an early period of his life, and consequently confirm the length of his reign. Many of the coins of both these princes have alphabetical monograms, which, if accepted as numeral ones, may assist us in our conjectures. On the copper coins of MENANDER we find HA or 81, which can only refer to the Bactrian æra. On the silver coin found by Colonel TOD, we find IΔ or 14, which can only refer to his individual reign. HB or 82 is also found on the coins of MENANDER, which brings us nearly to the number indicated by HE or 85, the lowest number to be found on the coins of EUCRATIDES. That this prince succeeded MENANDER in the government of the countries immediately south of the Caucasus appears unquestionable; but it was most likely by forcible assumption: for had he been the lawful successor of MENANDER, he was not of a character to have relinquished his Indian possessions, where it would appear almost certain he did not reign: these observations are necessary, because the adoption of a monogram by MENANDER, which may be supposed to indicate the Bactrian æra, might induce an opinion that he was the predecessor of EUCRATIDES in Bactriana proper; while other circumstances we have noted seem to prove that he was not, independently of the ambiguous nature of the monograms themselves. The age depicted on the busts of APOLLODOTUS, and on those of the early coins of MENANDER, seem so nearly to agree, that while we would fain consider the latter as the successor of the former, we can scarcely suppose him the son, and our alternative is to conjecture him the brother. If MENANDER be admitted to have reigned in Bactria, we fancy APOLLODOTUS must be also; and it may be granted that their joint reigns might conveniently fill the interval between EUTHYDEMUS and EUCRA-

TIDES of twenty-four years, if our calculation thereof be conceded; but when we find the principal scenes of the military operations of these princes were in India, joined with other circumstances, as well as the discovery of the coins of ANTIMACHUS, the probability appears to be that they ruled originally, as before advanced, in the regions immediately north and south of the Indian Caucasus. EUTHYDEMUS, a monarch of great capacity, would appear to have been fortunate in his sons, (possibly by various mothers, for polygamy was a vice, according to CURTIUS, that the Greeks adopted from the barbarians,) by whose means he extended his territories, and greatly increased the dignity of the Bactrian empire. It may be supposed that he apportioned his empire amongst his sons, allowing them to retain the countries they had individually subjected: thus we may account for the kingdom of DEMETRIUS in Arachosia; for that of APOLLODOTUS and MENANDER in Bactriana Latior and the regions south of the Caucasus; and we may perhaps be allowed to consider ANTIMACHUS as the eldest son and successor of his father in Bactriana proper. . That this distribution of power was agreeable to the parties concerned, we may conjecture, when, in absence of direct information, there are grounds for belief that no war originated between them. The epoch of ANTIMACHUS cannot, we suspect, were only the excellence of his coins adduced, be dated posterior to that of EUCRATIDES; after whose death, the knowledge of Grecian arts and sciences may naturally be supposed to have declined: indeed the copper coins of EUCRATIDES himself, although a powerful monarch, exhibit a striking inferiority of execution, compared with those of EUTHYDEMUS, which the coins of ANTIMACHUS rival. We may suppose the reign of EUTHYDEMUS to have been the most brilliant of the Bactrian monarchy, or that in which the Grecian arts were most cultivated and flourishing.

I am not allowed to place ANTIMACHUS prior to APOLLODOTUS; for I have shewn how strong are the latter prince's claims to be considered the founder of *Euthydemia*, which, if admitted, decide him to have been the son of EUTHYDEMUS. Neither can we place him subsequent to MENANDER, because we have indubitable proof that EUCRATIDES, by some means or other, succeeded MENANDER, in the rule of the countries dependent on *Bactria ad Caucasum:* had ANTIMACHUS governed there, his coins would certainly have been found at *Beghrám*, with those of EUTHYDEMUS, who must have preceded him, and of EUCRATIDES, who must have followed him, and in common with those of APOLLODOTUS and MENANDER. Neither did he succeed MENANDER in the sovereignty of his Indian conquests; for then his coins would have exhibited Indian characters on the reverses, rather than Bactrian ones: there can be no doubt but that the coins of ANTIMACHUS are genuine Bactrians. Convinced that

ANTIMACHUS must have reigned posterior to EUTHYDEMUS, and anterior to EUCRATIDES, while he could neither have preceded APOLLODOTUS, nor succeeded MENANDER, we have no alternative but to place his reign between the two former princes, and to suppose him cotemporary with the two latter: thus nearly yielding decisive proof that he was the son and successor of EUTHYDEMUS in Bactriana proper.

To omit no circumstances likely to throw light upon the subjects under discussion, I advert to the nature and character of the deposit of Bactrian coins, which yielded five of ANTIMACHUS, seven of APOLLODOTUS, and 108 of MENANDER; for matters apparently trivial may sometimes furnish valuable hints. A person, from some motive or other, conceals a sum of money, the coins of which he will possess the larger number are those of the reigning prince; it is however easy to imagine that he may have a few of the prince who preceded in rule, and a few of any neighbouring or cotemporary sovereign. The person, who made the deposit thus preserved for us, we may presume, did so in the reign of MENANDER, which accounts for the notable proportion of that prince's coins; the few of APOLLODOTUS seem to point him out as the predecessor of MENANDER, and the fewer of ANTIMACHUS intimate, that he was a neighbouring and cotemporary prince. The length to which I have carried my observations on these coins, and the topics they involve, might justify my being taxed with prolixity, did they not relate to a subject so interesting and intricate as that of Bactrian history; and I shall conclude them by inserting a new table of the reigns and successions of the Bactrian sovereigns, agreeably to the suppositions, the probability of which I have advocated.

TABLE.

Theodotus I. established his sovereignty	B.C. 255, reigned 12 years	1 to 12	of Bactrian æra.
Theodotus II. began to reign	B.C. 243, reigned 23 years	12 to 35	of do.
Euthydemus began to reign	B.C. 220, reigned 25 years	35 to 60	of do.
Antimachus began to reign	B.C. 195, reigned 24 years	60 to 84	of do.
Eucratides began to reign	B.C. 171, reigned 25 years	84 to 109	of do.
Successor of Eucratides began to reign	B.C. 146, reigned years unknown,	109 to period unknown.	

Note.—The period B.C. 125, fixed for the destruction of the empire, liable to much distrust.

I continue to discover the coins of EUCRATIDES in the same numbers, but have met with none of new types. I have noted that this monarch's coins are not found east of *Kábul*, affording the presumption that his sway did not extend thither.

Among the coins collected this year, I have not discovered one by which we can identify the successor of EUCRATIDES; but among the new which may claim to be considered Bactrian, we have one with the classical name of DIOMÈDES.

We are also without any trace of HELIOCLES, who would appear to have no claim to be introduced among the early Bactrian sovereigns;

but if the coin discovered of him be clearly Bactrian, which the reverse probably would decide, he may still be admitted his rank among the later sovereigns of the Bactrian dynasty, or among those arising from its destruction.

We have this year procured intelligible specimens, which enable me to decipher some of those left in doubt in my Memoir of last year; and have fallen upon two or three altogether new, from the characters on the reverse, might be considered Bactrian; at all events, they are Greek, and I submit my opinion on them in the succeeding observations.

With so many coins before us of princes who have more or less pretensions of being Bactrian sovereigns, we may feel tempted to doubt whether the Grecian authority in Bactriana was subverted by the Getæ at so early a period as that assigned, unless the fact be supported by the fullest historical evidence. It may be, the recorded subversion amounted to no more than a temporary inroad of barbarians, which may have indeed involved the loss of royalty in the family of EUCRATIDES, and its assumption by some fortunate leader, who repelled the invasion; the probability appears to be that the Greek power in Bactriana, in the first instance, weakened by the incursions of the Getæ and other Scythic tribes, was ultimately annihilated by the overgrown empire of Parthia. But a Greek authority must have existed to a much later period in the countries west of the Indus, which would appear to have been finally subverted by the Sákyan princes, who had established themselves in the regions east of the Indus. Without attaching extraordinary importance to the hyperbolical strains of a *Carmen Seculare*, we may observe, that HORACE, who flourished about the commencement of the Christian æra, enumerates among the objects of sufficient magnitude to engage the attention of AUGUSTUS, the Bactrian empire, which we would have to have been destroyed above 120 years before the time he wrote :—

> " Tu civitatem quis deceat status
> Curas, et orbis solicitus, times
> Quid Seres, et regnata Cyro
> Bactra parent, Tanaisque discors."

Class Grecian—Series 2. *Unrecorded Kings of Bactria.*

I have thought proper to include in this general series all the coins, of whatever description, which may have Bactrian characters on the reverse legends. I by no means however wish to assert that all these princes ruled in Bactriana proper, perhaps no one of them did so. This series at present includes ANTIMACHUS, HERMÆUS I., II., III., DIOMEDES, ANTILAKIDES, AUSIUS*, ADELPHORTES, PALERKES, BASILIS†, ALOUOKENES, AZU I., II., DEMETRIUS, (?) and three other coins among the unidentified

* LYSIUS.—ED. † AZILISOS.—ED.

ones, or in all seventeen names: of these I am willing to transfer ANTIMACHUS to the regular Bactrian dynasty, HERMÆUS I., II., to the dynasty of APOLLODOTUS and MENANDER, and ADELPHORTES, BASILIS, and AZO, to a dynasty which I hope to prove, one day, to have existed distinctly at *Massaga*.

Class Grecian—Series 3. *Coins of* AGATHOCLES, PANTALEON, *&c.*

This year yielded me the same proportion of the coins of these princes, and I suspect we have found two other coins, which, with reference to the characters, may be classed with them, viz. Nos. 30 and 32 of the Greek coins now enumerated: if this be correct, we shall have five princes of this series.

Class Grecian—Series 4. *Coins of the Nysæan Kings.*

Of these kings we have the topes or cenotaphs at *Jelálábád:* there appear to have been two great families; that of HERMÆUS and his descendants, whose coins are distinguished by the figure of HERCULES, with his club on the reverse, and those of the princes, whose coins have a horseman on the obverse, and the figure of CERES on the reverse: to these must unquestionably be added the great king whose coins bear the legend ΒΑΣΙΛΕΥC ΒΑΣΙΛΕΩΝ ΣΩΤΗΡ ΜΕΓΑC, and I make no doubt UNADPHERROS: the latter family is the more ancient; and if our views are right, came originally from *Massaga*. There are thirteen topes certainly, perhaps fourteen, at *Jelálábád*, which may safely be referred to these princes; five or six to the family of HERMÆUS, and the remainder to that of the others; if three of these be not the topes of saints, rather than of kings: this I infer from their position on eminences, and the absence of coins with the relics found in them.

Note.—Of the prince whose coinage is delineated as fig. 37 in the last Memoir, I have procured many other coins: but none enabling me to identify his name: these coins, like the former, all from *Beghrám*.

Class Indo-Scythic—Series 1 *and* 2. *Coins of* KANERKOS *amd* KADPHIS.

I have discovered that the topes of *Kábul* refer to the families of these princes, as do a number of topes near *Chahárbág*, or *Jelálábád;* but these latter I very much suspect to be duplicates of the former. This year has given us a number of golden medals of these princes, which are noted below.

I have not been yet enabled to locate the capital of the princes whose coins form the other series of this class.

Recapitulation of Greek coins collected from Beghrám, 1834.

Copper of Euthydemus,	3
Apollodotus,	31
Menander,	56
Eucratides,	92
Diomedes,	1
Adelphortes,	1

Various,	5	
Hermæus I,	31	
Hermæus II,	5	
Hercules type,	179	
Megas,	267	
Unadpherros,	16	
Antilakides, Lysius,	21	
Agathocles,	19	
Pantaleon,	2	
Leonine	23	
As fig. 37 of Memoir 1833,	14	
Small Nysæans,	24	
Total,	790	Greek copper coins.
Silver coin (drachma) of Antimachus,	1	
Total,	791	Greek coins.

ANALYSIS OF COINS.

[With the present memoir Mr. MASSON furnished drawings of all the coins here enumerated. Many of them however having been already figured in the plates published with our notes on the Ventura collection in June last, we have thought it unnecessary to lithograph the whole, and have consequently made selection of those only which are new types, or have more legible inscriptions than our own. The text, in justice to the author we, have inserted entire, merely substituting the word *No.* for *Fig.* and given a second reference to the plates where such as are new will be found.—ED.]

Series 1st.—Recorded Kings of Bactria.

Euthydemus.

No. 1. *Obverse.*—Bearded bust. [*Pl.* II. *fig.* 1.]

Reverse.—Horse at speed. Legend Greek BAΣIΛEΩΣ EYΘYΔHMOY.

No. 2. *Obverse.*—Bearded bust. (*Fig.* 2.)

Reverse.—Not represented, same as preceding figure.

No. 1. is one of three coins of the same type, two procured from Beghrám, and one from Jelálábád. These are the curious coins with a concave obverse, which were noted in my last Memoir of last year, having then one unrecognizable specimen from Beghrám. The first intelligible specimen was obtained at Jelálábád, on which I was delighted to find the name of EUTHYDEMUS. Fig. 2 is a single specimen from Beghrám, the obverse not concave.

Apollodotus.

Nos. 3, 4, and 5. *Obverses.*—Figure of Elephant. Legend Greek BAΣIΛEΩΣ AΠOΛΛOΔOTOY ΣΩTHPOY. (*Fig.* 3; *see vol.* iv. *Pl.* XXVI. *fig.* 5.)

Reverses.—Figure of Brahminical Cow. Legend Bactrian.

These Figures represent the types found among seven silver coins of APOLLODOTUS, comprised in a parcel of 121 Bactrian silver coins, purchased from an individual at *Kábul*, but discovered in the Hazaurehját. These coins essentially agree, the monograms only varying.

This year's researches has elicited a circular copper coin of this prince, but not represented, being of similar type with his quadrangular coins.

Menander.

No. 6. (*Fig.* 4.) *Obverse.*—Bust, the head bound with fillet or diadem. Legend Greek ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΥ ΜΕΝΑΝΔΡΟΥ.

Reverse.—Warrior, standing to left; right hand upraised, holding a bundle of darts; left hand holding forth an embossed shield. Monogrammical characters on either side of the feet. Legend Bactrian.

This fine silver coin was purchased at *Kábul.*

Nos. 7 to 11. (*Figs.* 6, 8.) *Obverses.*—Busts. Legends as preceding.

Reverses.—As in preceding Figure. Legend Bactrian.

These types are selected from 110 silver coins of this prince procured this year, one received as a present in *Kábul*, one procured at *Beghrám*, and 108 procured with the seven of APOLLODOTUS just noted. These coins essentially agree, varying principally in the head-dress and position of the busts, and in the position of the figures on the reverses. Figs. 9 and 10 are distinguished by the spear or javelin in the right hand, and the nakedness of the bust: the monogrammical characters on these coins vary much, and it is remarkable that scarcely any two of the 108 coins found in one parcel appear to have been struck with the same die, the differences in them, however slight, being conclusive as to that fact; it may farther be observed, that copper coins of MENANDER are to be found, exhibiting all the types and monogrammical characters to be found on these silver ones.

No. 12. (*Fig.* 5.) *Obverse.*—Bust. Legend Greek, as preceding figs.

Reverse.—Fish. (Dolphin ?) Legend Bactrian.

This fine copper coin was procured from *Beghrám*, the monogrammical characters .

No. 13. (*Fig.* 7.) *Obverse.*—Wheel or emblematical figure. Legend Greek, as preceding figs.

Reverse.—Palm branch. Legend Bactrian.

This small copper coin, a single specimen was procured from *Beghrám*, the monogrammical characters  are to be found on the silver coins noted above, as fig. 8.

Class Grecian—Series 2. Unrecorded Kings of Bactria.

Antimachus.

No. 14. *(Fig.* 9.*) Obverse.*—Helmeted and winged female (Victory ?) standing to the left, holding in extended right hand a palm branch. Legend Greek ΒΑΣΙΛΕΩΣ ΝΙΚΗΦΟΡΟΥ ΑΝΤΙΜΑΧΟΥ. (*See vol.* iv. *Pl.* XXI. *fig.* 3.)

Reverse.—Mounted warrior at speed. Legend Bactrian.

This fine silver coin is one of six silver coins of similar type and size procured this year, one from Beghrám, and five in the same parcel as the 108 of MENANDER and seven of APOLLODOTUS before noticed. The monogram  on the obverse, is also to be met with on the coins of MENANDER; as fig. 9 of these plates. Were this monogram interpretable, we should have no difficulty in definitely appropriating these coins.

Hermæus.

No. 15. *Obverse.*—Bust, head bound with fillet and diadem. Legend Greek ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΥ ΕΡΜΑΙΟΥ. (*See vol.* iv. *Pl.* XXIV.)

Reverse.—Figure of JUPITER enthroned. Legend Bactrian.

No. 16. *(Fig.* 11.*) Obverse.*—Bust, head bound with fillet or diadem. Legend Greek, as preceding figure.

Reverse.—Figure of JUPITER enthroned, with eagle or bird of JOVE perched on extended right hand. Legend Bactrian.

These two fine silver coins were purchased at *Kábul*. I have to apologize for having in my memoir of last year, asserted an opinion that HERMÆUS was the founder of the Greek Nysæan dynasty of kings; although it is certain that he ruled there, (that is at Nysa,) and even more easterly, as is evidenced by his numerous coins found both at Jelálábád and Peshâwar. The Bactrian characters on the reverses of this prince's coins, were not then noted with the attention they ought to have been. And the discovery since of two of his silver coins, (those now delineated,) and a single copper coin corresponding to *No.* 15, compel us to form other ideas of this prince, and authorize us to consider him, at least for the present, as one of the regular Bactrian dynastry. The enthroned figure on the reverse of *No.* 16, with the bird of JOVE seated on the hand, we presume, admits not a doubt, that the figure itself is intended to represent JUPITER; and the similar figures on the reverses of the copper coins of this prince, although not manifestly exhibiting the eagle, may be supposed to personify the same deity, and not HERCULES as before imagined. It seems probable, that the figures on the reverses of the silver coins of EUTHYDEMUS may be intended to indicate JUPITER. The copper coins, we had previously found, of HERMÆUS, have very pointed features, and pourtray a prince considerably advanced in years—the two silver coins now before us, with the single copper coin discovered this year, exhibit the features of youth, and justify us in concluding that his reign commenced when he was young, as the great proportion of the copper coins justify the conclusion, that it terminated at an advanced period of his life. We may fairly allow to this prince a reign of twenty-four or twenty-five years, a term which would accurately fill up the period between the demise of EUTHYDEMUS and the succession of EUCRATIDES, or, of that, from the demise of EUCRATIDES, to the alleged destruction of the Bactrian empire by the GETÆ; but a consideration of the general style of the execution of the coins of HERMÆUS, (although the two coins now under notice are beautiful ones, especially *No.* 16,) will scarcely allow us to intrude him as the successor of EUTHYDEMUS: it is fair, however, to observe, that the coins of the two princes bear the same figures on the reverses, and that the forms of both are circular. Neither are we willing to admit him to have been the successor of EUCRATIDES, for he would appear to have enjoyed a large reign, which we hardly suppose a prince who was alike a parricide would have done. It would be gratifying to detect the successor of EUCRATIDES in Bactriana proper, and amongst the whole of the coins discovered at Beghrám, holding their execution as the token of their precedence or antiquity, we find none which have equal pretensions with those of HERMÆUS: but this only proves, that he succeeded to his authority in the Caucasian provinces, and this is what we suspect to have been the case; for when we observe his superior silver coinage, when we are satisfied that his reign was long, and that his dominions extended to the Indus, or beyond that of EUCRATIDES, we repeat we can scarcely believe this powerful prince, and (if we judge from his portrait) beneficent one, to have been the parricide of his father, or him who was vanquished by the GETÆ. The silver coin (*No.* 16), exhibits a strong resemblance to the silver coin of MENANDER, (*No.* 6), as does the bust in form and features; the legend is also similarly arranged. These circumstances may perhaps sanction an inquiry, whether HERMÆUS may not have been the son and successor of MENANDER, depriv-

ed of his Caucasian provinces by EUCRATIDES on the death of his father, and recovering them after the murder of this prince, during the anarchy that then naturally prevailed. It is however more probable, as we have before hinted, that EUCRATIDES committed this act of aggression when MENANDER was still living, and this seems corroborated by all the coins of HERMÆUS found at Beghrám displaying an aged prince, while the coins before us prove, that he also ruled when young; whence we infer, that he must originally have reigned elsewhere, and as we find that his coins are met with very far eastward, we may presume that his original seat of empire was in that quarter, and that from thence he marched to the Caucasus, when the death of EUCRATIDES allowed him the opportunity: and in confirmation of which we find, that the Beghrám coins of this prince refer to the latter part of his reign. The proportion of his copper coins found at Beghrám, may also guide us in our estimate of the duration of his reign there. EUCRATIDES, we suppose, reigned 24 years; in 1833, we found 70 of his coins, and in 1834, 92, or 162 for 2 years; in 1833, we found of the coins of HERMÆUS 34, and in 1834, 31, or 65 for 2 years. Now by the common rule of three process, if 162 yield 24, 65 will yield 9+, say 10 years for the reign of HERMÆUS at Beghrám: but we find that he must have reigned much longer somewhere else, which seems to verify the inferences we have before drawn; and as, we hope, in ANTIMACHUS we have found a son and successor for EUTHYDEMUS, so we hope that in HERMÆUS we have discovered the son and successor of MENANDER. The difference in the execution of the coins of this prince and of other Bactrian kings, as well as the striking diversity in the purity of the Greek characters, may perhaps be accounted for by supposing, that the better coins are those struck at the metropolitan mints, where Greek artists would be found, and that the inferior ones were struck at provincial mints, where, if Greek artists were not to be procured, the more expert native ones would be employed. We have discussed at some length the merits of the coins of HERMÆUS, but let us mislead no one; on subjects so difficult as these Bactrian coins, much is still left to conjecture, and at present, little more can be done than to expose the difficulties that attend them.

Diomedes.

No. 17. *(Fig.* 10.*) Obverse.*—Two erect figures, standing to the front, right hands holding spears, swords by the side. Legend Greek ΙΑΕΩΣ.ΩΤΗΡΟΣ ΔΙΟΜΗΔΟΥ.

Reverse.—Humped cow. Legend Bactrian.

This is the type of a single quadrangular copper coin procured this year from Beghrám, fortunately presenting without doubt in the legend, the nomen and cognomen. DIOMEDES SOTER. The monogram on the reverse 𐨤; is also found on the coins of ANTIMACHUS and APOLLODOTUS.

Antilakides.

No. 18. *Obverse.*—Bust, the hair of the head behind, bound into a kind of pod resembling a bag-wig. Legend Greek, obscure, but undoubtedly ΒΑΣΙΛΕΩΣ ΝΙΚΗΦΟΡΟΥ ΑΝΤΙΑΛΚΙΔΟΥ. (*See vol.* iv. *Pl.* XXVI. *fig.* 10.)

Reverse.—Two conical emblems, with two palm branches fixed between them. Legend Bactrian. This is a single specimen, (as to the circular form of the coin,) procured this year from Beghrám. The coin no doubt refers to the same prince whose coins are delineated in figs. 13 and 14, of Series 2, Class Grecian, of my last year's memoir. The features of the prince on this coin are much younger than those marked on the quadrangular coins, and the monogram varies, being 𐨤.

Grecian Coins - Recorded Kings of Bactria.



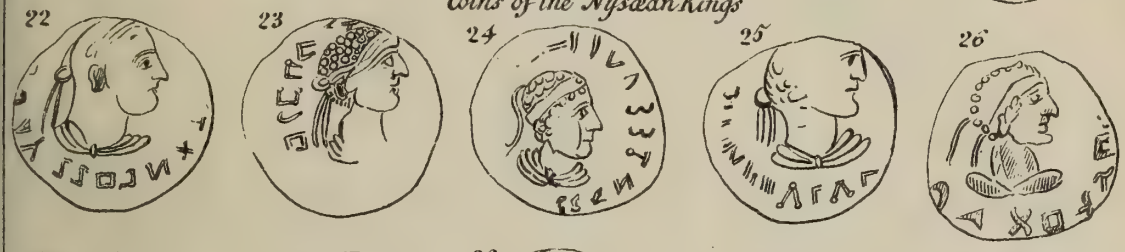
Unrecorded Kings of Bactria



Grecian Coins. Unrecorded Kings of Bactria.



Coins of the Nysæan Kings





Indo-Scythic





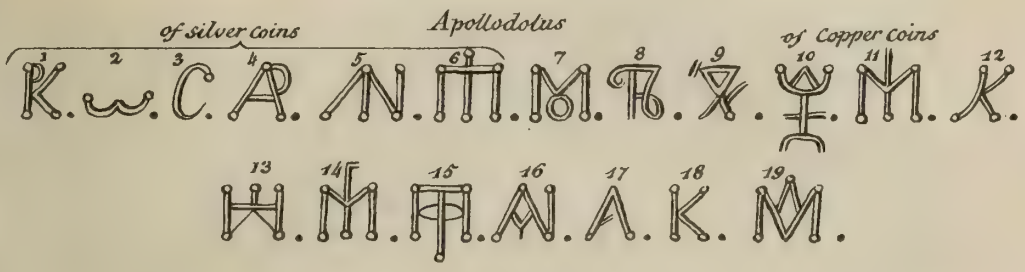
Sassanian Coins

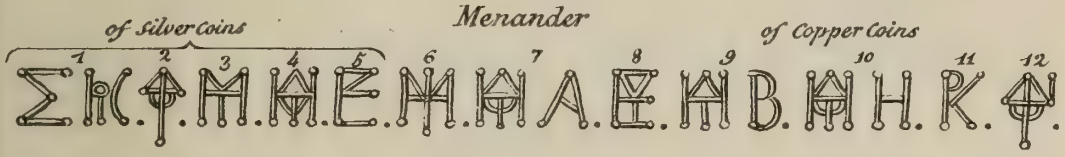




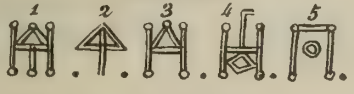
J.B. Tassin's Lith^d Press, Calcutta.

Monogrammical and Symbolical Characters of Bactrian Coins.

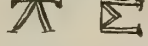




Eucratides

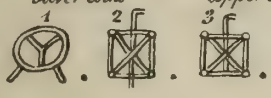


Ausius



Hermæus I

Silver coins Copper Coins



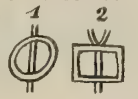
Adelphorles



Hermæus II.



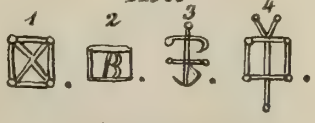
Basilisos



Hermæus III.



Asos



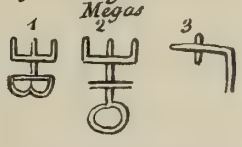
Antimachus

Silver



of the Nysæan Coins

Mēgas



Dionedes



Of the Leonine Coins



Antilakides

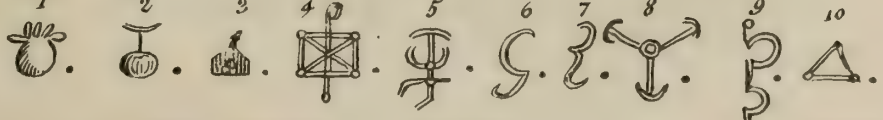
Silver Copper



Of the Indo Scythic Coins



Various



—The characters on the legend are pure Bactrian, as are those on the coins of Ausius (Lysius), figs. 15 and 16, of Series 2, Class Grecian, of last year.

Hermæus.

No. 19. *(Fig.* 12.*) Obverse.*—Bust, with tuft or pod on top of head. Legend Greek, ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΕΡΜΑΙΟΥ.

Reverse.—Horse. Legend Bactrian.

The type of this coin was given in our memoir of last year (fig. 38). The present year we procured a more perfect specimen from Jelálábád: the coin is certainly Bactrian, judging by the characters on the legend of the reverse, and the pod on the head of the bust, together with the nature of the reverse, seem to militate against the opinion, that this coin may represent the quadrangular coinage of Hermæus before noticed.

Adelphortes.

Nos. 20, 21. *(Figs.* 13, 14.*) Obverse.*—Mounted warrior. Legend Greek, ΒΑΣΙΛΕΩΣ ΣΠΑΛΥΡΙΟΥ ΔΙΚΑΙΟΥ ΑΔΕΛΦ□ΡΤ□Υ. *(See vol.* iv. *Pl.* XXI. *fig.* 9.*)*

Reverse.—Seated female deity, with mace or truncheon in right hand. Legend Bactrian.

This type was represented last year as fig. 44. Jelálábád this year yielded two fair specimens, from which the Greek legend is undoubtedly as above inserted; the reverse legend is as manifestly Bactrian.

Palerkes.

No. 22. *(Fig.* 15.*) Obverse.*—Standing figure with trident in right hand. Legend Greek,.....ΒΑΣΙΛΕ⊔Ν ΜΕΓΑΛ□Υ ΠΑΛΗΡΚ□Υ. *(See vol.* iv. *Pl.* XXI. *fig.* 9.*)*

Reverse.—Seated figure. Legend Bactrian.

This type was represented last year as fig. 40. A more perfect specimen procured this year from Kábul, identifies the legend to be as above cited, the word ΒΑΣΙΛΕ⊔Σ being undoubtedly the one not plain.

Basilis (Azilisos.)

No. 23. *(Fig.* 16.*) Obverse.*—Horseman. Legend Greek....portion legible ΕΓΑΛΟΥ. ΑΖΙΛCoΥ.

Reverse.—Elephant. Legend Bactrian.

This is a single specimen procured at *Kábul*, the legend entire would probably have been ΒΑCΙΛΕ⊔C ΒΑCΙΛΕ⊔Ν ΜΕΓΑΛoΥ ΒΑCΙΛΙCoΥ.

Alouokenou (Qy.) (*Megalou Nonou ?*)

No. 24. *(Fig* 17.*) Obverse.*—Figure of Hercules erect, with club. Legend Greek, obscure. *(See vol.* iv. *Pl.* XXI. *fig.* 10.*)*

Reverse.—Infantry soldier, holding wreathe in right hand, and armed with sword, spear and shield. Legend Bactrian.

This type was presented last year, as figs. 39 and 43. We have not discovered a single coin of this type during the present year, but introduce this figure here from the probability, on referring to the specimen we held, that the name of the prince was ΑΛΟΥΟΚΗΝΟΥ; the only doubt is as regards the letters ΚΗΝ.

Asou (Azou.)

No. 25. *Obverse.*—Horseman. Legend Greek, portion visible ΒΑΣΙΛЄΩ.... Ε....ΑΛΟΥ ΑΣΟΥ. (*See vol.* iv. *Pl.* XXII. *fig.* 9.)

Reverse.—Humped cow. Legend Bactrian.

This is one of two specimens procured at *Kábul;* the entire legend would undoubtedly be ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΑΣΟΥ.

No. 26. *Obverse.*—Humped bull, with monogram over the hump, and another under the head. Legend Greek, obscure. (*See vol.* iv. *Pl.* XXII. *figs.* 1, 2, 3.)

Reverse.—Monstrous animal, with symbolical monogram over the back. Legend, characters doubtful.

One of three specimens procured at Jelálábád; the legend is in pure Greek characters, and by comparison is undoubtedly ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΑΣΟΥ. The characters on the reverse legend I apprehend not to be Bactrian, but rather Nysæan. The monograms on these coins vary: one specimen gives the form  over the hump of the bull, and this coincides with the monogram on *No.* 25, with  over the animal on the reverse: this form occurs on *No.* 23.

Unidentified Coins.

No. 27. *Obverse.*—Elephant. Legend defaced. (*Vol.* iv. *Pl.* XXI. *fig.* 11.)

Reverse.—Seated figure with trident. Legend defaced.

This is a single specimen from Kábul. In absence of the legend, it may be pronounced Greek.

No. 28. *Obverse.*—Rampant lion. Legend Greek, obscure.

Reverse.—Humped bull. Legend Bactrian. (Omitted by mistake; like Azos coin.)

This type was represented last year; the present has afforded no new specimen, and we introduce it again, that it may not be lost sight of, and because we suspect part of the legend to bear the character ΔΗΜΕΦΟ. We at first inclined to read it ΔΗΜΗΤΡΙΟΥ, but we presume the character Ε, which is decisively plain, will not allow it.

No. 29. (*Pl.* II. *fig.* 18.) *Obverse.*—Bust, head bound with fillet or diadem. Legend Greek, portion legible ΟΗΤΟΡΟ.

Reverse.—Enthroned figure, probably JUPITER. Legend Bactrian.

This is a single specimen from Beghrám, which had nearly given us the name of another Greek king, for after the insertion of the word ΒΑΣΙΛΕΩΣ, there will be only room for one or two letters more, the first Ο may perhaps be a Δ.

No. 30. (*Fig.* 19.) *Obverse.*—Helmed bust, bearded.

Reverse.—Standing figure. Legend, unknown characters.

This is a single specimen from Beghrám; the characters on the reverse are singular, and may have some affinity with those on the coins of AGATHOCLES and PANTALEON.

No. 31. (*Fig.* 20.) *Obverse.*—Bust, head bound with fillet or diadem. Legend Greek, but defaced.

This is a single specimen from Beghrám. A fragment of a coin, the reverse quite smoothed.

No. 32. (*Fig.* 21.) *Reverse.*—Figure erect, legend, unknown characters.

This is a single specimen from Beghrám, the obverse had been hammered smooth: the characters, besides being singular, appear to vary on either side of the inscription; those to the right resemble the legends of AGATHOCLES and PANTALEON.

Class Grecian—Series No. 4. *Coins of Nysæan Kings.*

Nos. 33 *to* 40. (*Figs.* 23 *to* 29.) *Obverses.*—Busts, head bound with fillet or diadem. Legends Greek, but illegible.

These figures represent the types of the very numerous coins of this description found, which have invariably on the reverse an erect figure of HERCULES, resting on his club. They are given to shew the varieties of the legends, as well

as their incomprehensibility. Of all the coins of this class those of HERMÆUS are only intelligible (figs. 24 and 25, of our last year's memoir), and this prince seems to be entitled to be held the first of the line. From a tope at Jelálábád we extracted ten copper coins similar to fig. 40. The princes of this family appear to have been numerous. At *Jelálábád* we have five, if not six topes to be referred to them.

No. 41. (*Fig.* 30.) *Obverse.*—Horseman. Legend Greek, but obscure, portion visible ΟΛΙΛΙΙΙΣΙ.

Reverse.—Female figure. Legend Nysæan.

Single specimen from Kábul. The horseman on the obverse, and the legend on the reverse, enable us to refer this coin to the Greek Nysæan dynasty, but the legend is too difficult for interpretation.

Class Indo-Scythic—Series Nos. 1 *and* 2.

Pl. III. *Fig.* 1. *Obverse.*—Bust of king looking to the right. Sceptre in right hand, four-pronged monogram behind the head. Legend Greek BACIΛEVC OOH-MO KAΔΦICHC.

This is one of six golden medals of the same prince, extracted from a tope at Gool Durrah near Kábul. The reverse is not given, in no wise differing from that delineated in memoir of last year, fig. 24 of Indo-Scythic coins. The six medals essentially agree; but as the position of the bust varies, and there are other trivial but unimportant differences observable on all of them, they will have been struck at various times.

Fig. 2. *Obverse.*—Bust of king looking to the left. Sceptre in right hand. Legend Greek characters, PAO NANO PAO OOHPKI KOPANO.

Reverse.—Deity or saint looking to the right, lines of glory around the head, four-pronged symbol in front of figure. Legend Greek, NANA.

This golden medal was found in the same tope with the preceding one and the next to be described. The reverse NANA, enables us immediately to identify the prince as one of the Kanerkos family. The nature of the legend has been so fully displayed in the Journal of the Asiatic Society, that it becomes needless to dwell on it.

Fig. 3. *Obverse.*—Bust of king looking to the left. Sceptre in right hand. Legend Greek, probably same as on preceding coin, portion legible PAOOOKH-PKIKO PANO.

Reverse.—Figure of Deity or saint looking to the right. Right hand extended, four-pronged symbol in front of figure. Legend Greek HIIPO. (? *Mithro.*)

This golden coin found with the preceding ones noted in same tope.

Fig. 4. *Obverse.*—Erect figure of prince looking to the left, right hand in act of sacrificing upon an altar, left hand holding staff. Legend Greek NANOPAOKA NHPKI KOPA

Reverse.—Figure of Deity or saint looking to the right, with four-pronged symbol on right hand of, and other in front of, the figure. Legend Greek NANAPAO.

Gold coin purchased in *Kábul*, the addition of PAO on the obverse legend may be noted clearly, from position indicating holy.

Fig. 5. *Obverse.*—Helmed bust of prince, looking to the left, head surrounded with circles of glory. Sceptre in either hand. Legend Greek PAONANO PAOOOVOKIKOPA.

Reverse.—Figure of Deity or saint standing to the left, circles of glory around

the head, right hand extended, four-pronged figure in front of figure. Legend Greek ΦAPO.

Gold medal purchased in *Kábul*. This coin is interesting from the fine bust on the obverse, and from the new legend on the reverse*.

No. 6. Obverse.—Figure of prince clad in mail, in act of sacrifice, left hand supporting tridental staff. Legend characters intended for Greek PONOPOO BONOOPOVOBOKO. (*See observations on Kadphises Coins of vol.* III.)

Reverse.—Female figure, standing by side of cow. Legend apparently intended for OPNO.

No. 7. Obverse.—Same as preceding. Legend probably intended for RAO NONO POOBO RAONOKO NONO. (*See ditto.*)

Reverse.—Same as preceding. Legend probably OPNO. (*Doubtless* OKPO.)

These two gold coins were purchased at Kábul. They appear to be the gold coins of the prince whose copper coinage is delineated in fig. 12, Indo-Scythic coins of last year.

No. 8. *Obverse.*—Seated figure. Legend Greek, portion legible KOPANO.

Reverse.—Deity or saint, looking to the right. Four-pronged symbol in front of figure. Legend Greek NANA. (*See vol.* iv. *Pl.* LI. *figs.* 4, 13.)

No. 9. *Obverse.*—Seated figure as in preceding. Legend illegible. (*Do. fig.* 5.)

Reverse.—Deity or saint, looking to the left, with wreath in extended right hand. Four-pronged symbol in front of figure. Legend not apparent.

These coins (copper) were procured at *Kábul*, and introduced because, with reference to the seated figure on the obverse, they were of a type different from any we met with last year, although they clearly refer to the KANERKOS family.

Little need be remarked upon these Indo-Scythic coins, which appear to be likely to become more intelligible: suffice it to say, that eight topes in the neighbourhood of Kábul, at least, may be referred to princes of these families of KANERKOS and KADPHIS.

Sassanian Coins.

At the foot of Plate III. are inserted a few specimens out of the 187 silver coins of this class, extracted from the principal Tope of *Hiddah*, near *Jelálábád*. The majority were small coins, like fig. 6.

Monograms.

Plate IV. comprises all the varieties of monogram hitherto observed on the coins of APOLLODOTUS, MENANDER, EUCRATIDES and their descendants. Most of them are at once perceived to be combinations of Greek letters; but whether used as expressive of dates, or as the initials of the die-engraver or mint-master of the day, is not yet determined, although that they are the latter seems the more probable conjecture. The later symbols on the Indo-Scythic and Leonine coins, &c. are of a different class, and do not seem formed from alphabetical combinations.

II.—*Quotations from original Sanscrit authorities in proof and illustration of Mr.* HODGSON'S *sketch of Buddhism.*

[The following paper has been printed in the Transactions of the London Asiatic Society; but, from accidental circumstances to which it is not necessary further to allude, somewhat inaccurately.

* Probably this is a transposition of the letters of AΘPO.—ED.

The shortest way of amending these errors, and supplying at the same time some further information calculated to make the paper more generally intelligible, is to reprint it at Calcutta. This the author has, accordingly, now enabled us to do, the new information being given in the shape of additional notes, which it would indeed have been scarcely worth while to print separately from the text to which they refer. It is not our custom to republish articles already printed, and we do so now only under express invitation from the author, whose researches in Buddhism, aided by local advantages possessed by no other writer, it is of the highest importance to have correctly reported and preserved.—Ed.]

Preface.

Several distinguished orientalists having, whilst they applauded the novelty and importance of the information conveyed by my Sketch of Buddhism*, called upon me for proofs, I have been induced to prepare for publication the following translation of significant passages from the ancient books of the *Sangatas*, which still are extant in *Nepál* in the original *Sanscrit*.

These extracts were made for me (whilst I was collecting the works† in question) some years ago by Amirta Nanda Bandya, the most learned *Buddhist* then, or now, living in this country; they formed the materials from which chiefly I drew my sketch; and they would have been long since communicated to the public, had the translator felt sufficiently confident of his powers, or sufficiently assured that enlightened Europeans could be brought to tolerate the 'ingens indigestaque moles' of these 'original authorities;' which however, in the present instance, are original in a far higher and better sense than those of De Körös, or even of Upham. Without stopping to question whether the sages who formed the *Bauddha* system of philosophy and religion used *Sanscrit* or high *Prácrit*, or both, or seeking to determine the consequent pretension of Mr. Upham's authorities to be considered original‡, it may be safely said, that those of Mr. De Körös can support no claims of the kind.

* Transactions of the Royal Asiatic Society of London;—necnon, Transactions of Bengal Society, vol. xvi.

† The collection comprises, besides 60 volumes in *Sanscrit*, procured in *Nepál*, the very names of which had previously been unknown, some 250 volumes, in the language of *Tibet*, which were obtained from *Lássa* and *Digarchi*. But for the existence of the latter at Calcutta, Mr. De Körös's attainments in *Tibetan* lore had been comparatively useless. The former or *Sanscrit* books of *Nepál* are the authorities relied on in this paper. Since the first collection was made in *Nepál*, very many new works in the Sanscrit language have been discovered and are yet daily under discovery. The probability now is, that the entire *Kahgyur* and *Stangyur* may be recovered, in the original language. The whole series has been obtained in that of Tibet, 327 large volumes.

‡ These authorities however, even if allowed to be original, appear to consist entirely of childish legends. I allude to the three published volumes. The

The native works which the latter gentleman relies on are avowedly *Tibetan* translations of my *Sanscrit* originals, and whoever will duly reflect upon the dark and profound abstractions, and the infinite simally-multiplied and microscopically-distinguished personifications of Buddhism, may well doubt whether the language of *Tibet* does or can adequately sustain the weight that has been laid upon it.

Sanscrit, like its cognate Greek, may be characterised as a speech "capable of giving a soul to the objects of sense, and body to the abstractions of metaphysics." But, as the *Tibetan* language can have no pretensions to a like power, those who are aware that the *Sangatas* taxed the whole powers of the *Sanscrit* to embody in words their system, will cautiously reserve, I apprehend, for the *Bauddha* books still extant in the classical language of India, the title of original authorities. From such works, which, though now found only in *Nepál*, were composed in the plains of India before the dispersion of the sect, I have drawn the accompanying extracts; and though the merits of the "doing into English" may be small indeed, they will yet, I hope, be borne up by the paramount and (as I suspect) unique authority and originality of my "original authorities," a phrase which, by the way, has been somewhat invidiously, as well as laxly used and applied in certain quarters.

received hypothesis is that the philosophers of *Ayudhya* and *Magadha*, (the acknowledged founders of *Buddhism*) preferred the use of *Sanscrit* to that of *Prácrit*, in the original exposition of their subtle system, appears to me as absurd as it does probable that their successors, as *Missionaries*, resorted to Prácrit versions of the original Sanscrit authorities, in propagating the system in the remotest parts of the continent and in Ceylon. On this ground, I presume the Prácrit works of Ceylon and Ava to be translations, not originals:—a presumption so reasonable that nothing but the production from Ceylon or Ava of original Prácrit works, comparable in importance with the Sanscrit books discovered in Nepál, will suffice to shake it in my mind. Sir W. JONES I believe to be the author of the assertion, that the *Buddhists* committed their system to high Prácrit or Páli; and so long at least as there were no Sanscrit works of the sect forthcoming, the presumption was not wholly unreasonable. It is, however, so now. And Sir W. JONES was not unaware that *Magadha* or *Bihár* was the original head-quarters of *Buddhism*, nor that the best Sanscrit lexicon extant was the work of a *Bauddha*; nor that the *Bráhmans* themselves acknowledged the pre-eminent *literary* merits of their heterodox adversaries.

But for his *Bráhminical* bias therefore, Sir WILLIAM might have come at the truth, that the *Bauddha* philosophers employed the classical language.

Sir WILLIAM was further aware, that the old *Bauddha* inscriptions of *Gayá*, *Sanchi*, *Carli*, &c. are Sanscrit, not Prácrit. To me this last circumstance is decisive against the hypothesis in question. Throughout *Madhya Des* and the Upper *Deccan*, the numerous monuments of the *Buddhists* bear inscriptions in Sanscrit, and Sanscrit only. The Páli inscription at *Gayá* is recent, and avowedly the work of *Burmese*. [It is chiefly Burmese, not Pálí.—ED.]

It is still, I observe, questioned amongst us, whether *Bráhmanism* or *Buddhism* be the more ancient creed, as well as whether the latter be of Indian or extra Indian growth. The *Buddhists* themselves have no doubts upon either point. They unhesitatingly concede the palm of superior antiquity to their rivals and persecutors the *Bráhmans;* nor do they in any part of the world hesitate in pointing to India as the cradle of their faith.

Formerly we might be pardoned for building fine-spun theories of exotic upon the African locks of BUDDHA'S images : but surely it is now somewhat too late*, in the face of the abundant direct evidence which we possess, against the exotic theory, to go in quest of presumptions to the time-out-of-mind illiterate Scythians, in order to give to them the glory of originating a system built upon the most subtle philosophy, and all the copious original records of which are inshrined in *Sanscrit*†, a language which, whencesoever primevally derived, had been, when *Buddhism* appeared, for ages proper to the Indian continent.

The Buddhists make no serious pretensions to a very high antiquity : never hint at an extra Indian origin.

SAKYA SINHA is, avowedly, *Kshetriya;* and, if his six predecessors had really any historical existence, the books which affirm it, affirm too, that all the six were of *Bráhmanical* or *Kshetriyá* lineage. *Sangata* books treating on the subject of caste never call in question the antique fact of a fourfold division of the Hindu people, but only give a more liberal interpretation to it than the carrent *Bráhmanical* one of their day‡. The Chinese, the Mongols, the Tibetans, the Indo-Chinese, the Ceylonese and other Indian Islanders, all point to India as the fatherland of their creed. The records of *Buddhism* in *Nepál* and in *Tibet*, in both of which countries the people and their mother-tongues are of the *Mongol* stock, are still either *Sanscrit* or avowed translations from it by Indian *pandits*. Nor is there a single record or monument of this faith in existence, which bears intrinsic or extrinsic evidence of an extra Indian origin§.

* Recent discoveries make it more and more certain, that the cave temples of the Western Coast and its vicinity, are *exclusively Bauddha*. Every part of India is illustrated by splendid remains of Buddhism.

† The difference between high *Prácrit* and *Sanscrit*, could not affect this question, though it were conceded that the founders of *Buddhism* used the former and not the latter—a concession however, which should not be facilely made, and to which I wholly demur.

‡ See the *Bauddha* disputation on caste. Royal Asiatic Society's Transactions.

§ See CRAWFURD'S remarks on the purely Indian character of all the great sculptural and architectural monuments of *Buddhism* in Java. Also BARROW'S remarks to the same effect in his travels in China. The Chinese *Pusá*, is *Visvarupyá Prajná* or the polyform type of Diva Natura. See Oriental Quarterly

The speculations of a writer of Sir W. JONES's day (Mr. JOINVILLE), tending to prove argumentatively, from the characters of *Buddhism* and *Bráhmanism*, the superior antiquity of the former, have been lately revived (see Asiatic Journal No. CLX.) with applause. But besides that fine drawn presumptions are idle in the face of such a mass of direct evidence as we now possess, the reasonings of JOINVILLE appear to me altogether based on errors of fact. *Buddhism* (to hazard a character in few words), is monastic asceticism in morals, philosophical scepticism in religion; and whilst ecclesiastical history all over the world affords abundant instances of such a state of things resulting from gross abuse of the religious sanction, that ample chronicle gives us no one instance of it as a primitive system of belief. Here is a legitimate inference from sound premises. But that *Buddhism* was, in truth, a reform or heresy, and *not* an original system, can be proved by the most abundant direct evidence both of friends and of enemies. The oldest *Sangata* works incessantly allude to the existing superstition as the *Márcharya* or way of the serpent, contradistinguishing their reformation thereof as the *Bóddhi-charya* or way of wise; and the *Bráhmanical* impugners of those works (who, upon so plain a fact, could not lie), invariably speak of *Buddhism* as a notorious heresy.

An inconsiderable section of the *Sangatas* alone, ever held the bold doctrine of mortal souls: and the *Swábhávika* denial of a creation of matter by the fiat of an absolutely immaterial being springs, not out of the obesity of barbarian dulness, but out of the over refinement of philosophical ratiocination. JOINVILLE's idea of the speculative tenets of *Buddhism* is utterly erroneous. Many of them are bad indeed: but they are of philosophy all compact, profoundly and painfully subtle-sceptical too, rather than atheistically dogmatic.

At the risk of being somewhat miscellaneous in this preface, I must allude to another point. The lamented ABEL REMUSAT sent me, just before he died, a copy of his essay on the *Sangata* doctrine of the Triad; and Mr. UPHAM, I find, has deduced from REMUSAT's interpretation of that doctrine, the inference (which he supports by reference to sundry expressions in the sacred books of Ceylon), that I am in error in deny-

Magazine, No. xiv. pp. 218—222, for proofs of the fact that numberless *Bauddha* remains have been mistaken for *Bráhmanical* by our antiquaries, and even by the natives. In the same work I have proved this in reference to CRAWFURD's Archipelago, Oriental Quarterly, No. xvi. pp. 232, 235.

Yet, no sooner had I shown, from original authorities, how thoroughly *Indian Buddhism* is, than it was immediately exclaimed 'oh! this is *Nepálese* corruption! these are merely popular grafts from *Bráhmanism*.' The very same character belongs to the oldest monuments of *Buddhism* extant, in India and beyond it; and I have traced that character to the highest scriptural authorities.

ing that *Buddhism*, in its first, and most characteristic form, admits the distinction of Clerus et Laicus. It is difficult expressly to define that distinction; but it may be seen in all its breadth in *Bráhmanism* and in Popery; whilst in Islamism, and in the most enthusiastic of the Christian sects, which sprung out of the Reformation, it is wholly lost. According to my view, Apostolic Christianity recognised it not*; the congregation of the faithful, the Church, was a society of peers, of brethren in the faith, all essentially equal, in gifts, as in place and character. On earth, there were no indispensable mediators, no exclusive professional ones; and such alone I understand to be priests. Again, genuine monachism all over the world, I hold to be, in its own nature, essentially opposed to the distinction of clergyman and layman, though we all know that monastic institutions no sooner are rendered matters of public law and of extensive popular prevalence, than, ex vi necessitatis, the distinction in question is superinduced upon them, by the major part of the monks laicising, and the rest *becoming clergy*†.

There are limits to the number of those whom the public can support in idleness: and whoso would eat the bread of the public must perform some duty to the public. Yet who can doubt that the true monk, whether cœnobite or solitary, is he who abandons the world to save his *own* soul; as the true clergyman is he who mixes with the world to save the souls *of others?* The latter in respect to the people or laics has a distinctive function, and, it may be also an exclusive one: the former has no function at all. Amongst entirely monastic sects, then, the exclusive character of priest is objectless and absurd: and who that has glanced an eye over ecclesiastical history knows not that in proportion as sects are enthusiastic, they reject and hate, (though nothing tainted with monachism) the exclusive pretensions of the clergy! Whoever has been able to go along with me in the above reflections can need only to be told that primitive *Buddhism* was entirely monastic, and of an unboundedly enthusiastical genius‡, to be satisfied that it did not recognise the distinction in question. But if, being suspicious of the validity

* I would not be understood to lay stress on this opinion, which is merely adduced to illustrate my argument.

† History informs us that, soon after monachism supervened upon our holy and eminently social religion, there were in Egypt as many monks almost as peasants. Some of these monks necessarily laicised, and the rest became clergy. The community of the *Gosáins*, and several others, of strictly ascetical origin, exhibit the same necessary change after the sects had become numerously followed.

‡ Its distinguishing doctrine is that finite mind can be enlarged to infinite; all the schools uphold this towering tenet, postponing all others to it. As for the scepticism of the *Swabhavikas* relative to those transcendent marvels, creation and providence, it is sufficient to prove its remoteness from "flat Atheism," simply to point to the *coexistence* of the cardinal tenet first named.

of argumentative inferences, he demand of me simple facts, here they are. In the *Sata Sahasrika, Prajna Paramitá,* or *Racha Bhagavati,* and also in the nine *Dharmas* (the oldest and highest written authorities), it is affirmed more or less directly, or is clearly deducible from the context, in a thousand passages (for the subject is not expressly treated), that the only true followers of BUDDHA are monks, the majority being cœnobites, the rest, solitaries. The fullest enumeration of these followers *(Bhikshu Sráxaka* or *Srámana, Chailaka,* and *Arhata* or *Arhana* or *Arhanta)* proves them to have been all monks, tonsured, subject to the usual vows, (nature teaching to all mankind that wealth, women and power, are the grand tempters,) resident in monasteries *(Vihár)* or in deserts, and essentially peers, though of course acknowledging the claims of superior wisdom and piety. The true church, the congregation of the faithful, is constantly said to consist of such only; and I am greatly mistaken indeed if the church in this sense be synonymous with the clergy; or, if the primitive church of BUDDHA recognised an absolutely distinct body such as we (i. e. Catholics, Lutherans, and Kirkmen) ordinarily mean when we speak of the latter. The first mention of an exclusive, professional active, minister of religion, or priest, in the *Bauddha* books, is in those of a comparatively recent date, and not of scriptural authority. Therein the *Vajra Achárya* (for so he is called) first appears arrayed with the ordinary attributes of a priest. But his character is anomalous, as is that of every thing about him; and the learned *Bauddhas* of Nepal at the present day universally admit the falling off from the true faith. We have in these books, *Bhikshus Srávakas, Chailaks,* and *Sákya-Vansikas**, bound by their primitive rules for ten days (in memory of the olden time) and then released from them; tonsured, yet married; ostensibly monks, but really citizens of the world.

From any of the above, the *Vajra Achárya,* is drawn indiscriminately; he keeps the keys of the no longer open treasury; and he is surrounded

* An inscription at *Carli* identifies the splendid *Salivâhana* with the head of the Saka tribe, which is that of SAKYA SINHA. The *Sákya-Vansikas,* or people of the race of *Sákga,* appeared in *Nepál* as refugees from *Bráhman* bigotry, some time after *Buddhism* had been planted in these hills. *Sákya* is universally allowed to have been the son of king SUDDHODANA, sovereign of *Magadha or Bihár.* He is said to have been born in the "*Asthán* of *Kapila Muni,*" at *Ganga Ságar,* according to some; in *Oude,* as others say. His birth place was not necessarily within his father's kingdom. He may have been born when his father was on a pilgrimage to the shrine of the Saint KAPILA. SA'KYA died, according to my authorities, in Assam, and left one son named RAHULA BHADRA. The *Sakas* were *Kshetriyás* of the solar line, according to *Bauddha* authorities: nor is it any proof of the contrary that they appear not in the Bráhmanical genealogies. See note in the sequel.

with *untonsured* followers, who now present themselves for the first time. I pretend not to trace with historical nicety all the changes which marked the progress of *Buddhism* as a public institute and creed of millions up to the period of the dispersion : but I am well aware, that the primitive doctrines were not, because they could not be, *rigidly* adhered to, when what I hold to have been at first the closet speculation of some philosophers, had become the dominant creed of large kingdoms. That the latter character was, however, assumed by *Buddhism* in the plains of India, long before the dispersion, seems certain ; and, as many persons may urge that the thing in question is the dominant public institute, not the closet speculation, and that whatever discipline prevailed before the dispersion must be held for primitive and orthodox, I can only observe that the ancient books of the *Sangatas*, whilst they glance at such changes as I have adverted to, do so in the language of censure ; and that upon the whole, I still strongly incline to the opinion that genuine or primitive *Buddhism* (so I cautiously phrased it, originally) rejected the distinction of Clerus et Laicus ; that the use of the word priest by Upham, is generally inaccurate ; and that the *Sangha* of the *Buddhist* triad ought to have been invariably rendered by Remusat into 'congregation of the faithful' or 'church,' and never into 'clergy' or 'priesthood.' Remusat indeed seems to consider (*Observations*, 28-9, *and* 32), these phrases as synonymous ; and yet the question which their discrimination involves is one which, in respect to our own religion, has been fiercely agitated for hundreds of years ; and still, by the very shades of that discrimination, chiefly marks the subsisting distinction between the various Churches of Christ !

Following the authority he has relied on, Mr. Upham was at liberty, therefore, to adopt a sense which would consist with *my* interpretation of phrases such as he alluded to, and which, of course, I found copiously scattered over the works I consulted. I always rendered them advisedly into English, so as to exclude the idea of a priesthood, because I had previously satisfied myself, by separate inquiry and reflection, that that cardinal tenet was repugnant to the genius of the creed, and repudiated by its primitive teachers. This important point may have been wrongly determined by me ; but assuredly the determination of it upon such grounds as Mr. Upham's is perfectly futile. Such words as *Arhanta* and *Bandya*, (which, by the way, are the correct forms of the *Burmese Rahatun* and the Chinese *Bonze,)* no more necessarily mean, priest, clergy, than do the Latin, fideles and milites, as applied to Christianity ; and as for the word *Sangha*, it is indisputable that it does *not* mean *literally* priest*, and that it *does* mean *literally* congregation.

* Observations, p. 29.

If, as REMUSAT and UPHAM appear to insist is the case, every monastic follower of BUDDHA be a priest, then *Bandya* or *Bonze** must be rendered into English by the word 'clergyman.' But there will still remain as much difference between *Bandya* and *Sangha* as, in Christian estimation, between an ordinary parson of the present day, and one of the inspired primitive professors. Of old, the spirit descended upon all alike; and *Sangha* was this hallowed and gifted congregation. But the glory has passed away, and the term been long sanctified and set apart. So has, in part, and for similar reasons, the word *Arhata*. But *Bandya*, as a generic title, and *Bhikshu*, *Srávaka*, and *Chailaka*, as specific ones, are still every-day names of every-day people, priests, if it must be so, but, as I conceive, ascetics or monks merely. In the thick night of ignorance and superstition which still envelopes *Tibet*, the people fancy they yet behold *Arhatas* in the persons of their divine *Lámas*. No such imagination however possesses the heads of the followers of Buddha in Nepál, Ceylon, or extra Gangetic India; though in the last mentioned country the *name* Arhata is popularly applied to the modern order of the clergy, an order growing there, as in *Nepál*, (if my opinions be sound) out of that deviation from the primitive genius and type of the system which resulted necessarily from its popular diffusion as the rule of life and practice of whole nations.

In conclusion I would observe, that, in my apprehension, REMUSAT'S interpretation of the various senses of the Triadic doctrine is neither

* The possible meaning of this word has employed in vain the sagacity of sundry critics. In its proper form of *Bandya*, it is pure *Sanscrit*, signifying a person entitled to reverence, and is derived from *Bandana*.

Equally curious and instructive is it to find in the *Sanscrit* records of *Buddhism* the solution of so many enigmas collected by travellers from all parts of Asia; E. G. ELPHINSTONE'S mound is a genuine Chaitya, and its proper name is *Manikálaya*, or the place of the precious relic. The mound is a tomb temple. The 'tumuli eorum Christi altaria' of the poet, is more true of *Buddhism* than even of the most perverted model of Christianity; the *cause* being probably the same, originally, in reference to both creeds, viz. persecution and martyrdom, with consequent divine honours to the sufferers. The *Bauddhas*, however, have in this matter gone a step further in the descending scale of representative adoration than the Catholics; for they worship the mere image of that structure which is devoted to the inshrining of the relics of their saints; they worship the architectural model or form of the *Chaitya*.

The *Chaitya* of SAMBHU NATH in *Nepál* is affirmed to cover *Jyoti rupya* SWAYAMBHU, or the self-existent, in the form of flame: nor was there ever any thing *exclusive* of theism in the connexion of tomb and temple: for *Chaityas* were always dedicated to the *celestial Buddhas*, not only in *Nepál*, but in the plains of India, as the *Chaityas* of *Sanchi*, of *Gyá*, and of *Bág*, demonstrate. The *Dhyani Buddhas* appear in the oldest monuments of the continent and islands.

very complete, nor very accurate. In a religious point of view, by the first member is understood the founder of the creed, and all who, following his steps, have reached the full rank of a *Maha Yánika Buddha;* by the second, the law or scriptures of the sect; and by the third, the congregation of the faithful, or primitive church, or body of original disciples, or even, any and every assemblage of true, i. e. of *conventual ascetical* observers of the law, past or present.

In a philosophical light, the precedence of *Buddha* or of *Dharma* indicates the theistic or atheistic school. With the former, *Buddha* is intellectual essence*, the efficient cause of all, and underived. *Dharma* is material essence†, the plastic cause, and underived, a co-equal by unity with *Buddha ;* or else the plastic cause, as before, but dependent and derived from *Buddha. Sangha* is derived from, and compounded of, *Buddha* and *Dharma,* is their collective energy in the state of action ; the immediate operative cause of creation, its type or its agent‡. With the latter or atheistic school, *Dharma* is *Diva natura,* matter as the sole entity, invested with intrinsic activity and intelligence, the efficient and material cause of all.

Buddha is derivative from *Dharma,* is the active and intelligent force of nature, first put off from it and then operating upon it. *Sangha* is the *result* of that operation ; is embryotic creation, the type and sum of all specific forms, which are spontaneously evolved from the union of *Buddha* with *Dharma*§. The above are the principal distinctions, others there are which I cannot venture here to dwell on.

With regard to Remusat's remark, " ou voit que les trois noms sont placés sur le même niveau, comme les trois representations des même êtres dans les planches de M. Hodgson avec cette difference que sur celles-ci, *Sanga est* à *droite,* et *Dharma* à *gauche,*" I may just add, that the placing of *Sangha* to the right is a merely ritual technicality, conformable to the *pujá* of the *Dakshináchárs*||, and that all the philosophers and religionists are agreed in postponing *Sangha* to *Dharma.*

* *Bodhanatmaka iti Buddha,* ' the intellectual essence is Buddha.'

† *Dháranatmaka iti Dharma,* ' the holding, sustaining or containing substance is *Dharma.*' Again, *Prakriteswari iti Prajna,* ' the material goddess is *Prájna,*' one of the names of Dharma. The word *Prájna* is compounded of the intensive prefix *pra,* and *jnyana* wisdom, or *jna* to know. It imports the supreme wisdom of nature. *Dharma* is the universal substratum, is that which supports all form and quality in the versatile world.

‡ *Samudayatmika iti Sangha,* ' the multitudinous essence is *Sangha :*' multitude is the diagnosis of the versatile universe, as unity is of that of abstraction.

§ *Prajnaupaytmakany Jaggata.*

|| The theistic sects so call themselves, styling their opposites, the *Swabhavikas* and *Prajnikas, Vámachars.* The *Pauranikas,* too, often designate the *Tantrikas* by the latter name, which is equivalent to left-handed.

I possess very many drawings exhibiting the arrangement mentioned by REMUSAT ; but all subservient to mere ritual purposes, and consequently worthy of no serious attention. The *Matantara,* or variorum text of the *pujarís* of the present day, displays an infinite variety of formulæ*, illustrated by corresponding sculptural and pictorial devices, embodied in those works, and transferred from them to the walls and interior of temples existing all over the valley of Nepál.

[*To be continued.*]

III.—*Sivatherium Giganteum, a new Fossil Ruminant Genus, from the Valley of the Markanda, in the Siválik branch of the Sub-Himálayan Mountains. By* HUGH FALCONER, *M. D. Superintendent Botanical Garden, Seháranpur, and Captain* P. T. CAUTLEY, *Superintendent Doáb Canal.*

[The fossil here described is of such importance that we make no apology for reprinting the following article entire from the outcoming volume of the Physical Researches of the Society, having prepared the engraving of the head, so as to serve both editions : it should be remarked, in regard to the engraving, that the figure of the palate and teeth is on rather a larger scale than the rest.—ED.]

The fossil which we are about to describe forms a new accession to extinct Zoology. This circumstance alone would give much interest to it. But in addition, the large size, surpassing the rhinocreos ; the family of Mammalia to which it belongs ; and the forms of structure which it exhibits ; render the *Sivatherium* one of the most remarkable of the past tenants of the globe, that have hitherto been detected in the more recent strata.

Of the numerous fossil mammiferous genera discovered and established by CUVIER, all were confined to the Pachydermata. The species belonging to other families have all their living representatives on the earth. Among the Ruminantia, no remarkable deviation from existing types has hitherto been discovered, the fossil being closely allied to living species. The isolated position, however, of the Giraffe and the Camelidæ, made it probable, that certain genera had become extinct, which formed the connecting links between those and the other genera of the family, and further between the Ruminantia and the Pachydermata. In the Sivatherium† we have a ruminant of this description connecting the family with

* See the classified enumeration of the principal objects of *Buddha* worship appended to this paper. Appendix B.

† We have named the fossil, *Sivatherium,* from SIVA, the Hindú god, and *θηριον bellua.* The *Siválik* or Sub-Himálayan range of hills, is considered in the Hindu mythology, as the *Látiah* or edge of the roof of SIVA's dwelling in the *Himálaya,* and hence they are called the *Siva-ala* or *Sib-ala,* which by an easy transition of sound became the *Sewálik* of the English. The fossil has been discovered in a tract which may be included in the *Sewálik* range, and we have given the name of Sivatherium to it, to commemorate this remarkable formation so rich in new animals. Another derivation of the name of the hills, as explained by the *Mahant* or High Priest at *Dehra,* is as follows :

Sewálik a corruption of *Siva-wála,* a name given to the tract of mountains between the Jumna and Ganges, from having been the residence of Iswara SIVA and his son GANE's, who under the form of an Elephant had charge of the Westerly portion from the village of *Dúdhli* to the Jumna, which portion is also called *Gangaja, gaja* being in Hindí an Elephant. That portion Eastward from *Dúdhli,* or between that village and *Haridwár,* is called *Deodhar,* from its being the especial residence of *Deota* or Iswara SIVA : the whole tract however between the Jumna and Ganges is called *Siva-ala,* or the habitation of SIVA : unde der. *Sewálik.*

the Pachydermata, and at the same time so marked by individual peculiarities as to be without an analogue in its order.

The fossil remain of the Sivatherium, from which our description is taken, is a remarkably perfect head. When discovered, it was fortunately so completely enveloped by a mass of stone, that although it had long been exposed to be acted upon as a boulder in a water-course, all the more important parts of structure had been preserved. The block might have been passed over, but for an edging of the teeth in relief from it, which gave promise of something additional concealed. After much labour, the hard crystalline covering of stone was so successfully removed, that the huge head now stands out with a couple of horns between the orbits, broken only near their tips, and the nasal bones projected in a free arch, high above the chaffron. All the molars on both sides of the jaw are present and singularly perfect. The only mutilation is at the vertex of the cranium, where the plane of the occipital meets that of the brow: and at the muzzle, which is truncated a little way in front of the first molar. The only parts which are still concealed, are a portion of the occipital, the zygomatic fossæ on both sides, and the base of the cranium over the sphœnoid bone.

The form of the head is so singular and grotesque, that the first glance at it strikes one with surprise. The prominent features are—1st, the great size, approaching that of the elephant: 2d, the immense developement and width of the cranium behind the orbits: 3d, the two divergent osseous cores for horns starting out from the brow between the orbits: 4th, the form and direction of the nasal bones, rising with great prominence out of the chaffron, and overhanging the external nostrils in a pointed arch: 5th, the great massiveness, width and shortness of the face forward from the orbits: 6th, the great angle at which the grinding plane of the molars deviates upwards from that of the base of the skull.

Viewed in lateral profile, the form and direction of the horns, and the rise and sweep in the bones of the nose, give a character to the head widely differing from that of any other animal. The nose looks something like that of the rhinoceros; but the resemblance is deceptive, and only owing to the muzzle being truncated. Seen from in front, the head is somewhat wedge-shaped, the greatest width being at the vertex and thence gradually compressed towards the muzzle; with contraction only at two points behind the orbits and under the molars. The zygomatic arches are almost concealed, and nowise prominent: the brow is broad, and flat, and swelling laterally into two convexities; the orbits are wide apart, and have the appearance of being thrown far forward, from the great production of the frontal upwards. There are no crest or ridges: the surface of the cranium is smooth, the lines are in curves, with no angularity. From the vertex to the root of the nose, the plane of the brow is in a straight line, with a slight rise between the horns. The accompanying drawings will at once give a better idea of the form than any description.

Now in detail of individual parts; and to commence with the most important and characteristic, the teeth:

There are six molars on either side of the upper jaw. The third of the series, or last milk molar, has given place to the corresponding permanent tooth, the detrition of which and of the last molar is well advanced, and indicates the animal to have been more than adult.

The teeth are in every respect those of a ruminant, with some slight individual peculiarities.

The three posterior or double molars are composed of two portions or semi-cylinders, each of which incloses, when partially worn down, a double crescent of enamel, the convexity of which is turned inwards. The last molar, as is normal in ruminants, has no additional complication, like that

in the corresponding tooth of the lower jaw. The plane of grinding slopes from the outer margin inwards. The general form is exactly that of an ox or camel. on a large scale. The ridges of enamel are unequally in relief, and the hollows between them unequally scooped. Each semi-cylinder has its outer surface, in horizontal section, formed of three salient knuckles, with two intermediate sinuses; and its inner surface, of a simple arch or curve. But there are certain peculiarities by which the teeth differ from those of other ruminants.

In correspondence with the shortness of jaw, the width of the teeth is much greater in proportion to the length than is usual in the family: the width of the third and fourth molars being to the length as 2.24 and 2.2 to 1.55 and 1.68 inches, respectively: and the average width of the whole series being to the length as 2.13 to 1.76 inches. Their form is less prismatic: the base of the shaft swelling out into a bulge or collar, from which the inner surface slopes outward as it rises: so that the coronal becomes somewhat contracted: in the third molar, the width at the coronal is 1.93, at the bulge of the shaft 2.24. The ridges and hollows on the outer surface descend less upon the shaft, and disappear upon the bulge. There are no accessary pillars on the furrow of junction at the inner side. The crescentic plates of enamel have a character which distinguishes them from all known ruminants: the inner crescent, instead of sweeping in a nearly simple curve, runs zig-zag-wise in large sinuous flexures, somewhat resembling the form in the Elasmotherium.

The three double molars differ from each other only in their relative states of wearing. The antepenultimate, being most worn, has the crescentic plates less curved, more approximate and less distinct: the penultimate and last molars are less worn, and have the markings more distinct.

The three anterior or simple molars have the usual form, which holds in Ruminantia, a single semi-cylinder, with but one pair of crescents. The first one is much worn and partly mutilated: the second is more entire, having been a shorter time in use, and finely exhibits the flexuous curves in the sweep of the enamel of the inner crescent: the last one has the simple form of the permanent tooth, which replaces the last milk molar: it also shews the wavy form of the enamel.

Regarding the position of the teeth in the jaw; the last four molars, viz. the three permanent and the last of replacement, run in a straight line, and on the opposite sides are parallel and equi-distant: the two anterior ones are suddenly directed inwards, so as to be a good deal approximated. If the two first molars were not thus inflected, the opposite lines of teeth would form exactly two sides of a square: the length of the line of teeth, and the intervals between the outer surfaces of the four last molars, being almost equal, viz. 9.8 and 9.9 inches respectively.

The plane of detrition of the whole series of molars from rear to front is not horizontal, but in a slight curve, and directed upwards at a considerable angle with the base of the skull: so that when the head is placed, so as to rest upon the occipital condyles and the last molars, a plane through these points is cut by a chord along the curve of detrition of the whole series of molars at an angle of about 45°. This is one of the marked characters about the head:

Dimensions of the Teeth.	*Length. Inches.*	*Breadth. Inches.*
Last molar right side,	——	2.35
Penultimate do.	2.20	2.38
Antepenultimate do.	1.68	2.20
Last simple molar,	1.55	2.24
Second do. do.	1.70	1.95
First do. do.	1.70	1.90

	Outer Surfaces.	*Inner Surfaces.*
Interval between the surfaces of last molar,	9.9	5.5
Do. do. do. third molar,	9.8	5.5
Do. do. do. second do.	8.4	4.5
Do. do. do. first do.	6.4	3.2

Space occupied by the line of molars 9.8 inches.

Bones of the Head and Face.—From the age of the animal to which the head had belonged, the bones had become anchylosed at their commissures, so that every trace of suture has disappeared, and their limits and connections are not distinguishable.

The frontal is broad and flat, and slightly concave at its upper half. It expands laterally into two considerable swellings at the vertex, and sweeps down to join the temporals in an ample curve; and with no angularity. It becomes narrower forwards, to behind the orbits; and then expands again in sending off an apophysis to join with the malar bone, and complete the posterior circuit of the orbit. The width of the bone where narrowest, behind the orbit, is very great, being 16.2 inches. Partly between and partly to the rear of the orbits, there arise by a broad base, passing insensibly into the frontal, two short thick conical processes. They taper rapidly to a point, a little way below which they are mutilated in the fossil. They start so erect from the brow, that their axis is perpendicular to their basement: and they diverge at a considerable angle. From their base upwards they are free from any rugosities, their surface being smooth and even. They are evidently the osseous cores of two intra-orbital horns. From their position and size they form one of the most remarkable features in the head. The connections of the frontal are nowhere distinguishable, no mark of a suture remaining. At the upper end of the bone the skull is fractured, and the structure of the bone is exposed. The internal and outer plates are seen to be widely separated, and the interval to be occupied by large shells, formed by an expansion of the diploe into plates, as in the elephant. The interval exceeds 2½ inches in the occipital. On the left side of the frontal, the swelling at the vertex, has its upper lamina of bone removed, and the cast of the cells exhibits a surface of almond-shaped or oblong eminences, with smooth hollows between.

The temporal is greatly concealed by a quantity of the stony matrix, which has not been removed from the temporal fossa. No trace of the squamous suture remains to mark its limits and connection with the frontal. The inferior processes of the bone about the auditory foramen have been destroyed, or are concealed by stone. The zygomatic process is long, and runs forward to join the corresponding apophysis of the jugal bone, with little prominence or convexity. A line produced along it would pass in front, through the tuberosities of the maxillaries, and to the rear along the upper margin of the occipital condyles. The process is stout and thick. The temporal fossa is very long, and rather shallow. It does not rise up high on the side of the cranium: it is overarched by the cylinder-like sides of the frontal bone. The position and form of the articulating surface with the lower jaw are concealed by stone which has not been removed.

There is nothing in the fossil to enable us to determine the form and limits of the parietal bones; the cranium being chiefly mutilated in the region which they occupy. But they appear to have had the same form and character as in the ox: to have been intimately united with the occipitals, and to have joined with the frontal at the upper angle of the skull.

The form and characters of the occipital are very marked. It occupies a large space, having width proportioned to that of the frontal, and considerable height. It is expanded laterally into two alæ, which com-

mence at the upper margin of the foramen magnum, and proceed upwards and outwards. These alæ are smooth, and are hollowed out downwards and outwards from near the condyles towards the mastoid region of the temporal. Their inner or axine margins proceed in a ridge arising from the border of the occipital foramen, diverging from each other nearly at right angles, and enclose a large triangular fossa into which they descend abruptly. This fossa is chiefly occupied by stone in the fossil, but it does not appear shallow, and seems a modification of the same structure as in the elephant. There is no appearance of an occipital crest or protuberance. The bone is mutilated at the sides towards the junction with the temporals. Both here and at its upper fractured margin its structure is seen to be formed of large cells with the diploe expanded into plates, and the outer and inner laminæ wide apart. This character is very marked at its upper margin, where its cells appear to join on with those of the frontal. The condyles are very large, and fortunately very perfect in the fossil; the longest diameter of each is 4.4 inches, and the distance measured across the foramen magnum, from their outer angles, is 7.4 inches: dimensions exceeding those of the elephant. Their form is exactly as in the Ruminantia, viz. their outer surface composed of two convexities meeting at a rounded angle: one in the line of the long axis, stretching obliquely backwards from the anterior border of the foramen magnum; on the other forwards and upwards from the posterior margin, their line of commissure being in the direction of the transverse diameter of the foramen. The latter is also of large size, its antero-posterior diameter being 2.3 inches, and the transverse diameter 2.6 inches. The large dimensions of the foramen and condyles must entail a corresponding developement in the vertebræ, and modify the form of the neck and anterior extremities.

The sphenoidal bone, and all the parts along the base of the skull from the occipital foramen to the palate, are either removed, or so concealed by stone, as to give no characters for description.

The part of the brow from which the nasal bones commence is not distinguishable. The suture connecting them with the frontal is completely obliterated: and it is not seen whether they run up into a sinus in that bone, or how they join on with it. Between the horns there is a rise in the brow, which sinks again a little forward. A short way in advance of a line connecting the anterior angles of the orbits, there is another rise in the brow. From this point, which may be considered their base, the nasal bones commence ascending from the plane of the brow, at a considerable angle. They are broad and well arched at their base, and proceed forward with a convex outline, getting rapidly narrower, to terminate in a point curved downwards, which overhangs the external nostrils. For a considerable part of their length they are joined to the maxillaries: but forwards from the point where they commence narrowing, their lower edge is free and separated from the maxillaries by a wide sinus: so that viewed in lateral profile their form very much resembles the upper mandible of a hawk, detached from the lower. Unluckily in the fossil, the anterior margins of the maxillaries are mutilated, so that the exact length of the nasal bone that was free from connection with them cannot be determined. As the fossil stands, about four inches of the lower edge of the nasals, measured along the curve, are free. The same mutilation prevents its being seen how near the incisives approached the nasals, with which they do not appear to have been joined. This point is one of great importance, from the structure it implies in the soft parts about the nose. The height and form of the nasal bones, are the most remarkable feature in the head: viewed from above they are seen to taper rapidly from a broad base to a sharp point; and the vertical height of their most convex part above the brow at their base, is $3\frac{1}{2}$ inches.

The form of the maxillaries is strongly marked in two respects: 1st, their shortness compared with their great width and depth: 2nd, in the upward direction of the line of alveoli from the last molar forwards, giving the appearance (with the licence of language intended to convey an idea of resemblance without implying more) as if the face had been pushed upwards to correspond with the rise in the nasals; or fixed on at an angle with the base of the cranium. The tendency to shortness of the jaw was observed in the dimensions of the teeth, the molars being compressed, and their width exceeding their length to an extent not usual in the Ruminantia. The width apart, between the maxillaries, was noticed before; the interval, between the outer surfaces of the alveoli, equalling the space in length occupied by the line of molars. The cheek tuberosities are very large and prominent, their diameter at the base being 2 inches, and the width of the jaw over them being 12.2 inches, whereas at the alveoli it is but 9.8 inches. They are situated over the third and fourth molars; and proceeding up from them towards the malar, there is an indistinct ridge on the bone. The infra-orbitary foramen is of large size, its vertical diameter being 1.2 inch; it is placed over the first molar, as in the ox and deer tribe. The muzzle portion of the bone is broken off at about 2.8 inches from the 1st molar, from the alveolar margin of which, to the surface of the diastema, there is an abrupt sink of 1.7 inch. The muzzle is here contracted to 5.8 inches, and forwards at the truncated part to about 4.1. The palatine arch is convex from rear to front, and concave across. No trace of the palatine foramina remains, nor of the suture with the proper palatine bones. The sphœno-palatine apophyses and all back to the foramen magnum* are either removed or concealed in stone. In front, the mutilation of the bone, at the muzzle, does not allow it to be seen, how the incisive bones were connected with the maxillaries: but it appears that they did not reach so high on the maxillaries as the union of the latter with the nasals. The same cause has rendered obscure the connexions of the maxillaries with the nasals, and the depth and size of the nasal echancrure or sinus.

The jugal bone is deep, massive and rather prominent. Its lower border falls off abruptly in a hollow descending on the maxillaries: the upper enters largely into the formation of the orbit. The posterior orbital process unites with a corresponding apophysis of the frontal, to complete the circuit of the orbit behind. The zygomatic apophysis is stout and thick, and rather flat. No part of the arch, either in the temporal or jugal portions, is prominent: the interval between the most salient points being greatly less than the hind part of the cranium, and slightly less than the width between the bodies of the jugals.

The extent and form of the lachrymals, cannot be made out, as there is no trace of a suture remaining. Upon the fossil, the surface of the lachrymary region passes smoothly into that of the adjoining bones. There is no perforation of the lower and anterior margin of the orbit by lachrymary foramina, nor any hollow below it indicating an infra-orbital or lachrymary sinus. It may be also added, what was omitted before, that there is no trace of a superciliary foramen upon the frontal.

The orbits are placed far forwards, in consequence of the great production of the cranium upwards, and the shortness of the bones of the face. Their position is also rather low, their centre being about 3.6 inches below the plane of the brow. From a little injury done in chiseling off the stone, the form or circle of the different orbits does not exactly correspond. In the one of the left side, which is the more perfect, the long

* With the exception of a portion of the basilary region, which resembles that of the Ruminants.

axis makes a small angle with that of the plane of the brow: the antero-posterior diameter is 3.3 inches, and the vertical 2.7 inches. There is no prominence or inequality in the rim of the orbits, as in the Ruminantia. The plane of the rim is very oblique: the interval between the upper or frontal margins of the two orbits being 12.2 inches, and that of the lower or molar margin 16.2 inches.

* *Dimensions of the Skull of the Sivatherium Giganteum.*

	Eng. Inches.	*Métres.*
From the anterior margin of the foramen magnum to the alveolus of 1st molar,	18.85	.478
From do. to the truncated extremity of the muzzle,	20.6	.5268
From do. to the posterior margin of the last molar,	10.3	.262
From the tip of the nasals to the upper fractured margin of the cranium,	18.0	.4568
From do. do. to do. along the curve,	19.0	.4822
From do. do. along the curve, to where the nasal arch begins to rise from the brow,	7.8	.198
From the latter point to the fractured margin of the cranium,	11.2	.284
From the tip of the nasals to a chord across the tips of the horns,	8.5	.216
From the anterior angle, right orbit, to the first molar,	9.9	.251
From the posterior do. do. to the fractured margin of the cranium,	12.1	.3075
Width of cranium at the vertex (mutilation at left side restored), about	22.0	.559
Do. between the orbits, upper borders,	12.2	.3095
Do. do. lower borders,	16.2	.4108
Do. behind the orbits at the contraction of the frontal,	14.6	.3705
Do. between the middle of the zygomatic arches,	16.4	.4168
Do. between the bodies of the malar bones,	16.62	.422
Do. base of the skull behind the mastoid processes (mutilated on both sides),	19.5	.496
Do. between the cheek tuberosities of the maxillaries,	12.2	.3095
Do. of muzzle portion of the maxillaries in front of the first molar,	5.8	.149
Do. of do. where truncated (partly restored),	4.1	.104
Do. between the outer surfaces of the horns at their base,	12.5	.312
Do. do. do. fractured tips of ditto,	13.65	.347
Perpendicular from a chord across tips of do. to the brow,	4.2	.165
Depth from the convexity of the occipital condyles to middle of frontal behind the horns,	11.9	.302
Do. from the body of the sphœnoidal to do. between the horns,	9.94	.252
Do. from middle of the palate between the 3rd and 4th molars do. at root of the nasals,	7.52	.192
Do. from posterior surface last molar to extremity of the nasals,	13.0	.331
Do. from grinding surface penultimate molar to root of the nasals,	10.3	.262
Do. from the convexity near the tip of the nasals to the palatial surface in front of the first molar,	5.53	.14
Depth from middle of the alæ of the occipital to the swell at vertex of frontal,	8.98	.228
Do. from inferior margin of the orbit to grinding surface 5th molar,	7.3	.186
Do. from the grinding surface 1st molar to edge of the palate in front of it,	2.6	.066
Space from the anterior angle of orbit to tip of the nasals,	10.2	.2595
Antero-posterior diameter left orbit,	3.3	.084
Vertical do. do.	2.7	.0685
Antero-posterior diameter of the foramen magnum,	2.3	.058
Transverse do. do.	2.6	.066
Long diameter of each condyle,	4.4	.112
Short or transverse do. of do.	2.4	.0603
Interval between the external angles of do. measured across the foramen,	7.4	.188

Among a quantity of bones collected in the neighbourhood of the spot in which the skull was found, there is a fragment of the lower jaw of a very large ruminant, which we have no doubt belonged to the Sivatherium:

* To facilitate comparison with the large animals described in CUVIER'S Ossemen Fossiles, the dimensions are also given in French measure.

and it is even not improbable that it came from the same individual with the head described. It consists of the hind portion of the right jaw, broken off at the anterior third of the last molar. The coronoid apophysis, the condyle, with the corresponding part of the ramus, and a portion of the angle are also removed. The two posterior thirds only, of the last molar remain; the grinding surface partly mutilated, but sufficiently distinct to show the crescentic plates of enamel, and prove that the tooth belonged to a ruminant. The outline of the jaw in vertical section, is a compressed ellipse, and the outer surface more convex than the inner. The bone thins off, on the inner side towards the angle of the jaw, into a large and well marked muscular hollow: and running up from the latter, upon the ramus towards the foramen of the artery, there is a well defined furrow, as in the Ruminantia. The surface of the tooth is covered with very small rugosities, and striæ, as in the upper molars of the head. It had been composed of three semi-cylinders, as is normal in the family, and the advanced state of its wearing proves the animal from which it proceeded to have been more than adult.

The form and relative proportions of the jaw agree very closely with those of the corresponding parts of a buffalo. The dimensions compared with those of the buffalo and camel are thus:

	Sivatherium.	*Buffalo.*	*Camel.*
Depth of the jaw from the alveolus last molar,....	4.95 inch.	2.65 inch.	2.70 inch.
Greatest thickness of do.	2.3	1.05	1.4
Width of middle of last molar, ...	1.35	0.64	0.76
Length of posterior $\frac{2}{3}$d of do.	2.15	0.95	1.15

No known ruminant, fossil or existing, has a jaw of such large size; the average dimensions above given being more than double those of a Buffalo, which measured in length of head 19.2 inches (.489 mètres); and exceeding those of the corresponding parts of the rhinoceros. We have therefore no hesitation in referring the fragment to the Sivatherium Giganteum.

The above comprises all that we know regarding the osteology of the head from an actual examination of the parts. We have not been so fortunate hitherto, as to meet with any other remain, comprising the anterior part of the muzzle either of the upper or lower jaw*. We shall now proceed to deduce the form of the deficient parts, and the structure of the head generally, to the extent that may be legitimately inferred, from the data of which we are in possession.

Notwithstanding the singularly perfect condition of the head, for an organic remain of such enormous size, we cannot but regret the mutilation at the muzzle and vertex, as it throws a doubt upon some very interesting points of structure in the Sivatherium: 1st, the presence or absence of incisive and canine teeth in the upper jaw, and their number and character if present; 2nd, the number and extent of the bones which enter into the basis of the external nostrils; and 3rd, the presence or absence of two horns on the vertex, besides the two intra-orbital ones.

* In a note received from Captain CAUTLEY while this paper is in the press, that gentleman mentions the discovery of a portion of the skeleton of a Sivatherium in another part of the hills: *See Journal As. Soc. Vol. IV.* "During my recent trip to the *Siwáliks* near the Pinjôr valley, the field of Messrs. BAKER and DURAND'S labours, I regretted much my inability to obtain the dimensions of one of the most superb fossils I suppose that ever was found. It was unfortunately discovered and excavated by a party of work people employed by a gentleman with whom I was unacquainted; and although I saw the fossil when in the rock, I was prevented from getting the measurements afterwards. This specimen appeared to consist of the femur and tibia, with the tarsal, metatarsal, and phalanges of our Sivatherium." It is much to be regretted that such an opportunity should have been lost of adding to the information already acquired of this new and gigantic Ruminant.—SEC.

Regarding the first point, we have nothing sufficient to guide us with certainty to a conclusion, as there are ruminants both with and without incisives and canines in the upper jaw; and the Sivatherium differs most materially in structure from both sections. But there are two conditions of analogy which render it probable that there were no incisives. 1. In all ruminants which have the molars in a contiguous and normal series, and which have horns on the brow, there are no incisive teeth. In the camel and its congeners, where the anterior molars is unsymmetrical and separated from the rest of the series by an interval, incisives are present in the upper jaw. The Sivatherium had horns, and its molars were in a contiguous series: it is therefore probable that it had no incisives. Regarding the canines there is no clue to a conjecture, as there are species in the same genus of ruminants both with and without them. 2. The extent and connections of the incisive bones are points of great interest, from the kind of developement which they imply in the soft parts appended to them.

In most of the horned ruminantia, the incisives run up by a narrow apophysis along the anterior margins of the maxillary bones, and join on to a portion of the sides of the nasals; so that the bony basis of the external nostrils is formed of but two pairs of bones, the nasals and the incisives. In the camel, the apophyses of the incisives terminate upon the maxillaries without reaching the nasals, and there are three pairs of bones to the external nostrils, the nasals, maxillaries and incisives. But neither in the horned ruminants, nor in the camel and its congeners, do the bones of the nose rise out of the plane of the brow with any remarkable degree of saliency, nor are their lower margins free to any great extent towards the apex. They are long slips of bone, with nearly parallel edges, running between the upper borders of the maxillaries, and joined to the ascending process of the incisive bone, near their extremity, or connected only with the maxillaries; but in neither case projecting so as to form any considerable re-entering angle, or sinus, with these bones.

In our fossil, the form and connections of the nasal bones, are very different. Instead of running forward in the same plane with the brow, they rise from it at a rounded angle of about 130°, an amount of saliency without example among ruminants, and exceeding what holds in the rhinoceros, tapir, and palæotherium, the only herbivorous animals with this sort of structure. Instead of being in nearly parallel slips, they are broad and well arched at their base, and converge rapidly to a sharp tip, which is hooked downwards, over-arching the external nostrils. Along a considerable portion of their length they are unconnected with the adjoining bones, their lower margins being free and so wide apart from the maxillaries, as to leave a gap or sinus of considerable length and depth in the bony parietes of the nostrils. The exact extent to which they are free, is unluckily not shown in the fossil, as the anterior margin of the maxillaries is mutilated on both sides, and the connection with the incisives destroyed. But as the nasal bones shoot forward beyond the mutilated edge of the maxillaries, this circumstance, together with their well defined outline and symmetry on both sides of the fossil, and their rapid convergence to a point with some convexity, leaves not a doubt that they were free to a great extent and unconnected with the incisives.

Now to determine the conditions in the fleshy parts, which the structure in the bony parietes of the nostrils entails.

The analogies are to be sought for in the ruminantia and pachydermata.

The remarkable saliency of the bones of the nose, in the Sivatherium, has no parallel, in known ruminants, to guide us; and the connection of the nasals with the incisives, or the reverse, does not imply any important difference in structure in the family. In the Bovine section, the Ox and the Buffalo have the nasals and incisives connected: whereas they are

separate in the Yák* and Aurochs. In the Camel, they are also separate, and this animal has greater mobility in the upper lip than is found in other ruminants.

In the Pachydermata, both these conditions of structure are present and wanting in different genera ; and their presence or absence is accompanied with very important differences in the form of the corresponding soft parts. It is therefore in this family that we are to look for an explanation of what is found in the Sivatherium.

In the Elephant and Mastodon, the Tapir, Rhinoceros, and Palæotherium, there are three pairs of bones to the external nostrils ; the nasals, the maxillaries, and incisives†. In all these animals, the upper lip is highly developed, so as to be prehensile, as in the Rhinoceros, or extended into a trunk, as in the Elephant and Tapir ; the amount of developement being accompanied with corresponding difference in the position and form of the nasal bones. In the Rhinoceros, they are long and thick, extending to the point of the muzzle, and of great strength to support the horns of the animal : and the upper lip is broad, thick, and very mobile, but little elongated. In the Elephant, they are very short, and the incisives enormously developed for the insertion of the tusks, and the trunk is of great length. In the Tapir, they are short and free, except at the base, and projected high above the maxillaries ; and the structure is accompanied by a well developed trunk. In the other Pachydermatous genera, there are but two pairs of bones to the external nostrils, the nasals and the incisives : the latter running up so as to join on with the former ; and the nasals, instead of being short and salient, with a sinus laterally between them and the maxillaries, are long, and run forward, united to the maxillaries, more or less resembling the nearly parallel slips of the Ruminantia. Of this genera, the Horse has the upper lip endowed with considerable mobility ; and the lower end of the nasals is at the same time free to a small extent. In all the other genera, there is nothing resembling a prehensile organ in the upper lip.

In the Sivatherium, the same kind of structure holds, as is found in the Pachydermata with trunks. Of these it most nearly resembles the Tapir. It differs chiefly in the bones of the nose being larger and more salient from the Chaffron ; and in there being less width and depth to the naso-maxillary sinus, than the Tapir exhibits. But as the essential points of structure are alike in both, there is no doubt that the Sivatherium was invested with a trunk like the Tapir.

This conclusion is further borne out by other analogies, although more indirect than that afforded by the nasal bones.

1st.—The large size of the infra-orbitary foramen. In the fossil, the exact dimensions are indistinct, from the margin having been injured in the chiseling off of the matrix of stone : the vertical diameter we make out to be 1.2 inch, which perhaps may be somewhat greater than the truth ; but any thing approaching this size, would indicate a large nerve for transmission, and a highly developed condition of the upper lip.

2nd.—The external plate of the bones of the cranium is widely separated from the inner, by an expansion of the diploe in vertical plates, forming large cells, as in the cranium of the Elephant : and the occipital is expanded laterally into alæ, with a considerale hollow between, as in the Elephant. Both these conditions are modifications of structure, adapted for supplying an extensive surface for muscular attachment, and imply a thick fleshy neck, with limited range of motion ; and, in more remote sequence, go to prove the necessity of a trunk.

* Cuvier. Ossemens Fossiles, tome iv. p. 131.
† Cuvier. Ossemens Fossiles, tome iii. p. 29.

3rd.—The very large size of the occipital condyles, which are greater both in proportion, and in actual measurement, than those of the Elephant, the interval between their outer angles, taken across the occipital foramen, being 7.4 inches. The atlas, and the rest of the series of cervical vertebræ, must have been of proportionate diameter to receive and sustain the condyles, and surrounded by a large mass of flesh. Both these circumstances would tend greatly to limit the range of motion of the head and neck. But to suit the herbivorous habits of the animal, it must have had some other mode of reaching its food; or the vertebræ must have been elongated in a ratio to their diameter, sufficient to admit of free motion to the neck. In the latter case, the neck must have been of great length, and to support it and the load of muscles about it, an immense developement would be required in the spinal apophysis of the dorsal vertebræ, and in the whole anterior extremity, with an unwieldy form of the body generally. It is therefore more probable that the vertebræ were condensed, as in the Elephant, and the neck short and thick, admitting of limited motion to the head: circumstances indirectly corroborating the existence of a trunk.

4th.—The face is short, broad, and massive, to an extent not found in the Ruminantia, and somewhat resembling that of the Elephant, and suitable for the attachment of a trunk.

Next with regard to the horns:—

There can be no doubt, that the two thick, short, and conical processes between the orbits, were the cores of horns, resembling those of the Bovine and Antilopine sections of the Ruminantia. They are smooth, and run evenly into the brow without any burr. The horny sheaths which they bore, must have been straight, thick, and not much elongated. None of the bicorned Ruminantia have horns placed in the same way, exactly between and over the orbits: they have them more or less to the rear. The only ruminant which has horns similar in position is the four-horned Antelope* of Hindustán, which differs only in having its anterior pair of horns a little more in advance of the orbits, than occurs in the Sivatherium. The correspondence of the two at once suggest the question, "had the Sivatherium also two additional horns on the vertex?" The cranium in the fossil is mutilated across at the vertex, so as to deprive us of direct evidence on the point, but the following reasons render the supposition at least probable:

1st.—As above stated, in the bi-cavicorned Ruminantia, the osseous cores are placed more or less to the rear of the orbits.

2nd.—In such known species as have four horns, the supplementary pair is between the orbits, and the normal pair well back upon the frontal.

3rd.—In the Bovine section of Ruminantia, the frontal is contracted behind the orbits, and upwards from the contraction, it is expanded again into two swellings, at the lateral angles of the vertex, which run into the bases of the osseous cores of the horns. This conformation does not exist in such of the Ruminantia as want horns, or as have them approximated on the brow. It is present in the Sivatherium.

On either supposition, the intra-orbitary horns are a remarkable feature in the fossil: and if they were a solitary pair on the head, the structure, from their position, would perhaps be more singular, than if there had been two additional horns behind.

Now to estimate the length of the deficient portion of the muzzle, and the entire length of the head:—

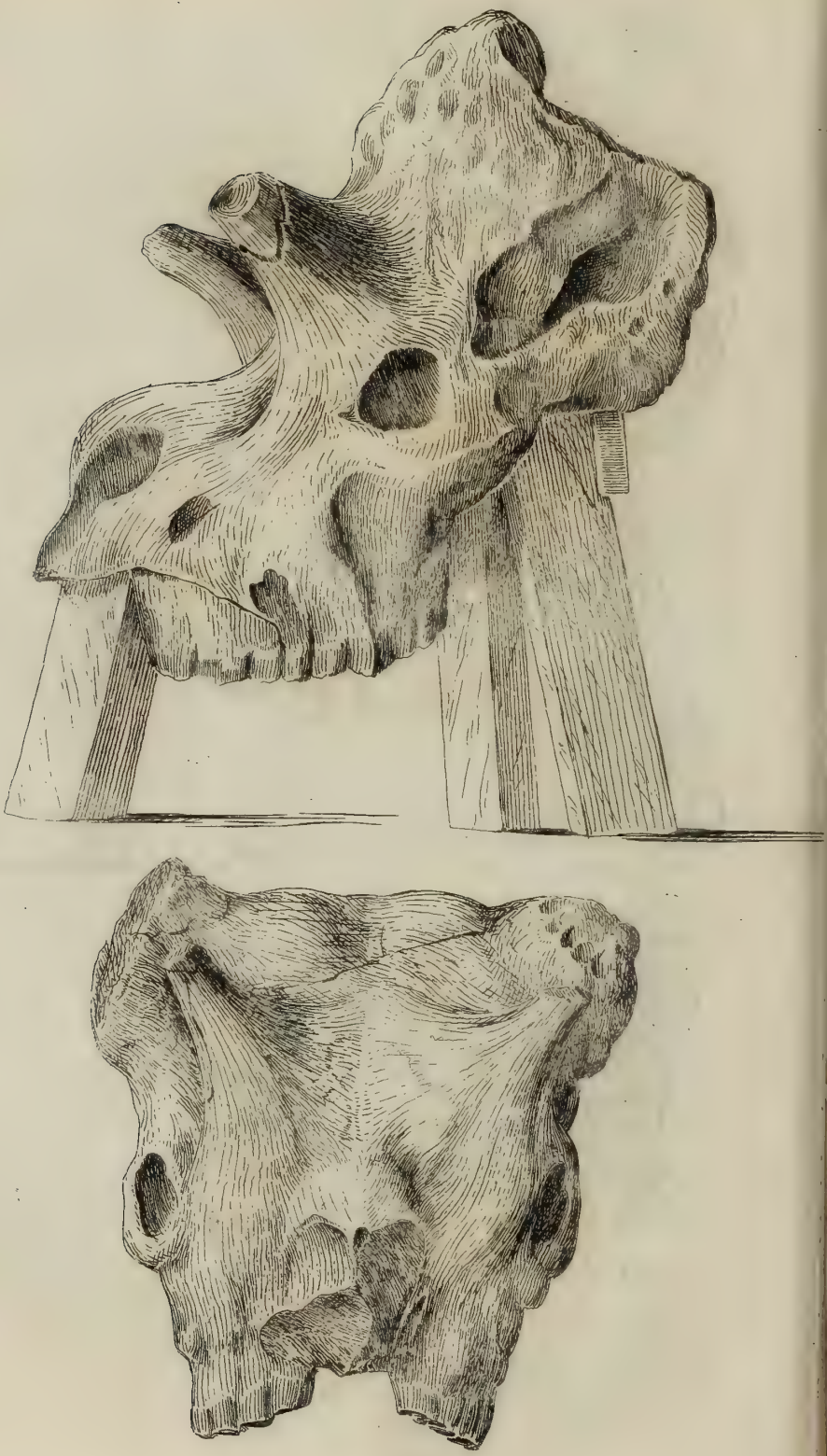
In most of the Ruminantia, where the molars are in a contiguous uninterrupted series, the interval from the first molar to the anterior border of the incisive bones is nearly equal to the space occupied by the molars; in some greater, in some a little less, and generally the latter. In other

* The *Tetracerus* or *Antilope Quadricornis* and *Chekara* of authors.



SIVATHERIUM

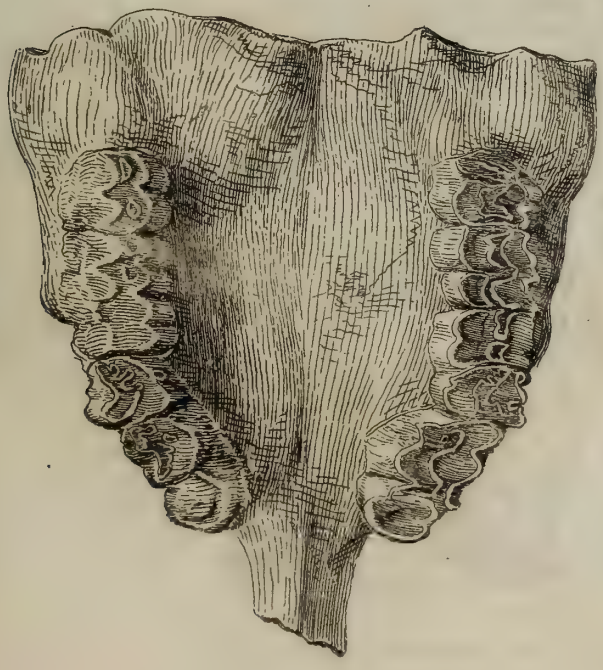
on a scale of one-seventh



Etched by Jas Atkinson from drawings by Capt Cautley

of the original.







Ruminantia, such as the Camelidæ, where the anterior molars are insymmetrical with the others, and separated from them by being placed in the middle of the diasteme, this ratio does not hold; the space from the first molar to the margin of the incisives being less than the line of molars. In the Sivatherium, the molars are in a contiguous series, and if on this analogy we deduce the length of the muzzle, we get nearly 10 inches for the space from the first molar to the point of the incisives; and 28.85 inches for the whole length of the head, from the border of the occipital foramen to the margin of the incisives; these dimensions may be a little excessive, but we believe them not to be far out, as the muzzle would still be short for the width of the face, in a ruminant.

The orbits next come to be considered. The size and position of the eye form a distinguishing feature between the Ruminantia and the Pachydermata. In the former, it is large and full, in the latter, smaller and sunken; and the expression of the face is more heavy in consequence. In the Sivatherium the orbit is considerably smaller in proportion to the size of the head than in existing ruminants. It is also placed more forward in the face, and lower under the level of the brow. The rim is not raised and prominent, as in the Ruminantia, and the plane of it is oblique: the interval between the orbits at their upper margin being 12.2 inches, and at the lower, 16.2 inches. The longitudinal diameter exceeds the vertical in the ratio of 5 to 4 nearly, the long axis being nearly in a line from the naso-maxillary sinus across the hind limb of the zygomatic circle. From the above we infer that the eye was smaller and less prominent than in existing ruminants: and that the expression of the face was heavier and more ignoble, although less so than in the Pachydermata, excepting the horse; also that the direction of vision was considerably forwards, as well as lateral, and that it was cut off towards the rear.

This closes what we have been led to infer regarding the organs of the head. With respect to the rest of the skeleton, we have nothing to offer, as we are not at present possessed of any other remains which we can with certainty refer to the Sivatherium*. Among a quantity of bones† collected from the same neighbourhood with the head fossil, there are three singularly perfect specimens of the lower portions of the extremities of a large ruminant, belonging to three legs of one individual. They greatly exceed the size of any known ruminant, and excepting the Sivatherium Giganteum, there is no other ascertained animal of the order, in our collection, of proportionate size to them. We forbear from further noticing them at present, as they appear small in comparison for our fossil: and besides, there are indications in our collection, in teeth and other remains, of other large ruminants, different from the one we have described.

The form of the vertebræ, and more especially of the carpi and tarsi, are points of great interest, to be ascertained; as we may expect modifications of the usual type adapted to the large size of the animal. From its bulk and armed head, few animals could be strong enough to contend with it, and we may expect that its extremities were constructed more to give support, than for rapidity of motion. But, in the rich harvest which we still hope to reap in the valleys of the *Markanda*, it is probable that specimens to illustrate the greater part of the osteology of the Sivatherium will at no very distant period be found.

* See Note to page 17.—Sec.

† We note here a very perfect cervical vertebræ of a Ruminant in our possession, which must have belonged to an animal of proportions equal to that of the Sivatherium, but from certain characters, we are inclined to suspect that it is allied to some other gigantic species of Ruminant, of the existence of which we have already tolerable certainty. Of the existence of the Elk, and a species of Camelidæ, Lieut. Baker of the Engineers has shewn us ample proof.

The structure of the teeth suggests an idea regarding the peculiarities of the herbivorous habits of the animal. In the description it was noticed that the inner central plate of enamel ran in a flexuous sweep, somewhat resembling what is seen in the Elasmotherium, an arrangement evidently intended to increase the grinding power of the teeth. It may hence be inferred, that the food of the Sivatherium was less herbaceous than that of existing horned ruminants, and derived from leaves and twigs: or that as in the horse, the food was more completely masticated, the digestive organs less complicated, the body less bulky, and the necessity of regurgitation from the stomach less marked than in the present Ruminantia.

The following dimensions, contrasted with those of the Elephant and Rhinoceros, will afford a tolerably accurate idea of the size of the Sivatherium. They are characteristic, although not numerous:—

	Elephant.	*Sivatherium.*	*Indian 1-horned Rhinoceros.*
From margin of foramen magnum to the first molar,	23.10 inch.	18.85 inch.	24.9 inch.
Greatest width of the cranium,	26.0	22.0	12.05
Do. do. of face between the malar bones,	18.5	16.62	9.20
Greatest depth of the skull,	17.80	11.9	11.05
Long diameter of the foramen magnum,	2.55	2.6	2.6
Short do. do. do.	2.4	2.3	1.5
Average of the above,	15.06	12.38	10.22

If the view which we have taken of the fossil be correct, the Sivatherium was a very remarkable animal, and it fills up an important blank in the interval between the Ruminantia and Pachydermata. That it was a ruminant, the teeth and horns most clearly establish; and the structure which we have inferred of the upper lip, the osteology of the face, and the size and position of the orbit, approximate it to the Pachydermata. The circumstance of any thing approaching a proboscis is so abnormal for a ruminant, that at the first view, it might raise a doubt, regarding the correctness of the ordinal position assigned to the fossil; but when we inquire further, the difficulty ceases.

In the Pachydermata, there are genera with a trunk, and others without a trace of it. This organ is therefore not essential to the constitution of the order, but accidental to the size of the head, or habits of the animal in certain genera. Thus in the Elephant, nature has given a short neck to support the huge head, the enormous tusks and the large grinding apparatus of the animal; and by such an arrangement, the construction of the rest of the frame is saved from the disturbance which a long neck would have entailed. But as the lever of the head became shortened, some other method of reaching its food became necessary; and a trunk was appended to the mouth. We have only to apply analogous conditions to a ruminant, and a trunk is equally required. In fact, the Camel exhibits a rudimentary form of this organ, under different circumstances. The upper lip is cleft; each of the divisions is separately movable and extensible, so as to be an excellent organ of touch.

The fossil was discovered near the *Markanda* river, in one of the small valleys which stretch between the *Kyárda-dún* and the valley of *Pinjór*, in the *Siválik* or sub-Himálayan belt of hills, associated with bones of the fossil Elephant, Mastodon, Rhinoceros, Hippopotamus, &c. So far as our researches yet go, the Sivatherium was not numerous. Compared with the Mastodon and Hippopotamus, (*H. Siválensis*, Nobis, a new species characterized by having six incisors in either jaw;) it was very rare.

Northern Doáb, Sept. 15, 1835.

IV.—*Horary Observations of the Barometer, Thermometer, and Wet-bulb Thermometer, made at Calcutta on the 21st and 22nd of December, 1835, by Mr.* H. Barrow, *Astr. and Math. Inst.-maker to the H. C.*

[Having ourselves inadvertently omitted the hourly observations appointed by the Meteorological Association at the Cape to be taken on the above day, we are most happy in being able to supply the omission from Mr. Barrow's register. As the Barometer registered monthly at the Assay office stands .014 higher than Mr. B.'s, that quantity must be added to the Bar. indications at 32° (in col. 7) to produce an accordance.—Ed.]

The barometer and wet-bulb thermometer were in a large room to the north, the doors and windows of which were open during the whole time. In the reductions* ·030 has been used as the constant for capiliary attraction, and it is only necessary to add that the barometer is of the mountain construction, with a screw at the bottom to bring the surface of the mercury to zero.

(*Calcutta mean time.*)

1835. Date.	Hour.	Barometer.	Attached Thermometer.	Wet-bulb Thermometer.	External Thermometer.	Barometer reduced to 32°.	Depression of Wet-bulb Thermometer.	Observer.
21 Dec.	6 A.M.	30,006	65,0	63,0	55,0	29,937	2,0	H. B.
	7	,024	62,2	61,0		,963	1,2	E. B.
	8	,038	64,0	62,0	62,0	,972	2,0	H. B.
	9	,068	66,7	63,0	66,0	,993	3,7	
	10	,070	68,3	63,9	69,5	,991	4,4	
	11	,054	69,8	64,0	71,6	,971	5,8	
	Noon.	,030	70,1	63,9	72,2	,946	6,2	
	1	29,990	70,9	62,5	73,1	,903	8,4	
	2	,974	71,1	62,0	73,2	,887	9,1	
	3	,972	71,6	62,2	73,5	,883	9,4	
	4	,972	71,0	62,1	72,0	,885	8,9	
	5							
	6	,989	69,2	63,7	66,2	,907	5,5	
	7	30,012	68,0	64,5	64,0	,934	3,5	
	8	,028	67,0	64,5	63,1	,953	2,5	
	9	,037	67,0	64,0	62,0	,962	3,0	
	10	,040	66,3	64,0	60,8	,967	2,3	
	11	,030	66,0	63,5	59,5	,958	2,5	
22nd.	Midnight.	,016	65,4	63,0	59,1	,946	2,4	
	1							
	2	,000	65,0	63,0	58,0	,931	2,0	
	3	29,984	64,0	62,0	58,0	,918	2,0	
	4	,982	64,0	62,0	57,0	,916	2,0	
	5	,986	62,8	61,8	57,0	,924	1,0	E. B.
	6	30,012	62,9	61,5	57,0	,949	1,4	
	7	,016	62,2	61,0	57,2	,955	1,2	
	8	,036	63,2	61,8	61,0	,972	1,4	H. B.
	9	,064	67,0	62,0	66,9	,989	5,0	
	10	,068	69,1	63,5	70,5	,987	5,6	
	11	,040	70,5	63,0	73,0	,954	7,5	
	Noon.	,020	71,9	63,0	74,0	,930	8,9	
	1	,000	72,2	63,0	75,0	,909	9,2	
	2	29,980	72,1	63,0	75,3	,890	9,1	
	3	,968	72,9	63,9	75,3	,875	9,0	
	4	,972	72,3	63,0	73,5	,881	9,3	
	5	,977	71,9	63,0	71,0	,887	8,9	
	6	30,000	70,5	63,6	67,5	,914	6,9	

* Of column 3, but not of column 7, which is fortunate, as we do not apply any correction for capillarity in our own register.—Ed.

V.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 6th January, 1836.

The Honorable Sir EDWARD RYAN, President, in the chair.

Sir CHARLES D'OYLY, Bart.; E. A. BLUNDELL, Esq. and Dr. H. FALCONER, proposed at the last meeting were duly elected members.

The meeting then proceeded to the annual election of office-bearers, when by scrutiny of names,

The Rev. Dr. MILL, W. H. MACNAGHTEN, Esq. Sir J. P. GRANT, and Sir B. MALKIN, were chosen Vice-Presidents for the ensuing year; and Messrs. H. T. PRINSEP, J. R. COLVIN, C. E. TREVELYAN, C. H. CAMERON, D. HARE, RAM COMUL SEN, Captains FORBES and PEMBERTON, and Dr. PEARSON, members of the Committee of Papers.

The Secretary communicated the results of the past year's proceedings.

The number of new members added to the list in 1835 had been,

Ordinary members,	28
Associate members,	4
Honorary members,	5

The loss by death, one; by departure to Europe, three; and withdrawal, one; in all, ... 5

The financial operations of the year were as follows:—

PAYMENTS.

	R.	A.	P.
To House Establishment and contingencies from 1st Nov. 1834, to 30th Nov. 1835,	2,868	8	10
To Salary of Curator, and Museum contingent, from 1st May to 30th Nov. 1835,	1,478	3	4
To Copies of the Journal supplied to members to 31st Dec.	1,056	0	0
To Printing 500 copies of Index,	1,210	0	0
To Ditto, 400 ditto, catalogue of Library Asiatic Society,	240	0	0
To Binding charges,	489	10	0
To Building Repairs,	1,175	8	9
To Purchase of a Cabinet,	100	0	0
To Balance in Bank of Bengal,	380	15	2
Sa. Rs.	8,998	14	1

RECEIPTS.

	R.	A.	P.
By Balance of last year's account,	3,101	10	4
By Quarterly Collections and admission fees, realized,	5,157	0	0
By two Dividends on the estate of Mackintosh and Co.	717	12	9
By Sale of Researches,	22	7	0
Sa. Rs.	8,998	14	1

	R.	A.	P.
Subscriptions due (partly irrecoverable,)	2,436	0	0
Interest of Govt. Paper not drawn,	1,417	1	11

thus leaving an available balance, without encroaching on the capital stock, of about 3,000 rupees to meet the expences of the current year, besides the quarterly subscriptions, which by a resolution of the 6th November will henceforth be collected in Company's rupees.

The separate account of the *publication of Oriental works* from the date of their transfer from the Committee of Public Instruction was as follows:

PAYMENTS.

	R.	A.	P.
To Pundits for correcting press,	139	0	0
To Maulavis for ditto,	217	0	0
To Binding charges, paper, &c.	100	10	9
To Printing prospectus, &c.	21	8	0
To Postage,	38	15	0
To Freight and Package, &c.	46	2	8
	563	4	5
To Printer's bills, due to 31st Dec.			
1 from Aug. to 30th Oct.	2,623	9	3
2 from 1st Nov. to 31st Dec.	1,069	7	6
3 for binding and covers,	454	0	3
Total, Sa. Rs.	4,710	5	5

RECEIPTS.

	R.	A.	P.
By Sale of Sanscrit Books,	90	0	0
By Ditto of Arabic ditto,	584	8	0
	674	8	0
By Subscriptions not collected, for works delivered to the parties,	7,403	0	0
Total, Sa. Rs.	8,077	8	0

leaving a profit of Sa. Rs. 3,367 2 7 upon the year's operations, to meet the current printing expences, in addition to the chance of further sale of the works now completed.

The ordinary publications of the Society during the past year, had been confined to the Index of the first 18 volumes of Researches, and a new edition of the Library Catalogue.

On the 6th May, it was resolved to give additional attention to the Society's museum of Natural History. A Curator and establishment were appointed, and measures were taken to accommodate the museum of antiquities, models, images, &c. in the gallery around the staircase, leaving the lower suite of apartments entirely open for objects of Natural History.

To the gallery also was added the fine collection of pictures, munificently presented by the sons of the late Mr. Home, one of the oldest members of the Society. These alterations and the preparation of Mineral Cabinets had enhanced considerably the year's expences, but the good effect had amply compensated. To the museum of fossil remains, some splendid additions had been conferred by Colonel Burney, Colonel Colvin, and Mr. Dean, and the collection of recent Osteology and of birds had been properly arranged and classified. A catalogue raisonnée had simultaneously been prepared by the Curator which would hereafter be submitted to the Committee of Papers for publication. In the mean time the strenuous assistance of members and friends of the institution was solicited to render the Society's museum worthy of public attention.

The resolution of the Government to make over the library of the College of Fort William to the "Public Library" lately instituted in Calcutta was coupled with a reservation of all the works exclusively oriental of which it is known that the College possesses a very extensive and valuable collection, comprising the whole library of Tippu Sulta'n. These, it was generally understood, the Government would be willing to transfer to the Asiatic Society should a request be expressed by this body to obtain them. As their possession would necessarily involve an increase of establishment, the Committee of Papers had hitherto hesitated making any application on the subject, but it was evidently desirable that such an opportunity of enriching its collection should be hailed with eager desire by a body devoted to the cultivation and study of Indian literature and history.

Library.

Two books in manuscript and six maps in the Burmese character, together with thirteen sketches and maps in the Assamese character were presented by Colonel G. Cooper, 34th Regt. N. I.

The Indian Journal of Medical Science, No. 25—*by the Editors.*

The Meteorological Register for Nov., 1835—*by the Surveyor General.*

On the salutary effects of the Convolvulus Nil upon the human constitution. M. S.—*by G. Cooper, Esq. the Author.*

A Prospectus of an intended publication "*Corpus Inscriptionum Indicarum,*" by M. Eugene Jacquet, Paris, was submitted for the information of members, and intending subscribers.

[Published on the cover of the November number.]

Museum.

One bow, a bird-cage, eleven arrows of sorts, and a specimen of the copper coin in use amongst the Choárs; together with an Assam arrow-head for killing tigers, were presented by G. Cooper, Esq.

A bit of petrified tamarind from Triewcurry on the Coromandel Coast, and a vulture, *(Vultur Ponticerianus,)* and a Mandarin's cap, were presented by Dr. L. BURLINI, for T. F. DE CRUZE, Esq.

A Pavooye *(Acridotheres Malabaricus)* was presented by Mr. J. STEPHENSON.

Read a letter from J. BELL, Esq. forwarding for inspection an animal called "the Slow Lemur" described in the 4th volume of the Asiatic Researches, by the late Sir WILLIAM JONES, and giving some further particulars of his habits.

Literary.

The Secretary apprized the meeting that he has received from Mr. W. H. SMOULT, the box of papers of the late Mr. MOORCROFT, which were in possession of the late W. FRASER, Esq. and which he was willing to place at the disposal of the Society, on the conditions expressed by the deceased: viz. that any profit accruing from their publication should go to the benefit of Mr. MOORCROFT's relatives in England.

The Society entirely concurring in this view resolved, that they should be immediately forwarded to Professor WILSON in England, to be made use of along with the former manuscripts, on the conditions specified.

A letter from the Vicar Apostolic of Cochin China, was read, requesting the Society to forward the specimen of the Dictionary, which he regretted to hear could not be printed in Calcutta, to the Oriental Translation Fund in England, in case that body should be inclined to patronize its publication.

A letter was read from Captain C. M. WADE, transmitting a second memoir by Mr. CHARLES MASSON, on the ancient coins discovered at Beghrám in the Kohistán, at Jelálábád and Kábul.

The memoir had been detained in Capt. WADE's possession, since the month of June last, in consequence of some official correspondence with Col. POTTINGER to whom the coins to which it relates have been finally forwarded for the Bombay Government.

The present memoir adds the names of DIOMEDES, PALERKOS, ALOUOKENES (?) to those already known, and gives some valuable information on the sites of the *Alexandria ad calcem Caucasi*, &c. It is published at length in the present number.

Wednesday Evening, the 3rd February, 1836.

Sir EDWARD RYAN, President, in the chair.

Lieut.-Col. J. COLVIN, Engrs., Lieut.-Col. L. R. STACY, JOHN NEAVE, Esq. C. S., and Lieut. A. CUNNINGHAM, were proposed as Members by Mr. JAMES PRINSEP, seconded by Sir EDWARD RYAN.

Rájah VIJAYA GOVINDA SINGHA Behadur of Purnea was also proposed by Mr. JAMES PRINSEP, seconded by Koomar RADHACANT DEB.

Read, a letter from Mr. E. A. BLUNDELL, acknowledging his election as a Member of the Society.

Read the following letter from His Highness Prince ESTERHAZY, Ambassador of His Imperial Majesty the Emperor of Austria at the British Court:

"*London, August* 4, 1835.

"SIR,

"In reply to the letter you addressed to me on the 25th January last, I have the honor to acknowledge the receipt of the boxes containing each twenty-five copies of a Tibetan Dictionary and Grammar, prepared for publication by the Hungarian Traveller Mr. ALEXANDER CSOMA KÖRÖSY, and printed at the expence of the British Indian Government, under the auspices of the Asiatic Society.

"These fifty copies being destined by Mr. KÖRÖSY to be presented by the different public Institutions of His Imperial Majesty's dominions, I lose no time in assuring you, that the learned Author's intentions shall be faithfully fulfilled.

"The enclosed letters and the Oriental works you have sent to the Antic Councellor VON HAMMER, have also been forwarded to their destination.

"I have not failed to inform my Government of the liberality with which the Indian Government has replaced the sum of 300 ducats, transmitted through this Embassy to Mr. CSOMA DE KÖRÖS, which had been lost by the failure of Messrs. ALEXANDER and Co., and anticipating its intentions, I seize with great pleasure this opportunity to express to you, and through your means to the Indian Government, as well as to the Asiatic Society, the high sense I entertain of the kind protection afforded to my learned countryman in His Britannic Majesty's dominions in India. Allow me to offer my sincerest thanks for such generous conduct.

"I have the honor to be, &c.

"ESTERHAZY."

Copy of this letter was directed to be communicated to the Government and to Mr. CSOMA KÖRÖSY, who left Calcutta a short time since on a tour through Tirhut and to the west of India.

Read a letter from H. CHAMIER, Esq., Chief Secretary to the Govt. of Fort St. George, directing that the Sixty Copies of 4th, 5th, and 6th volumes of Fatawá Alemgiri, subscribed for by the Madras Govt. should be forwarded, and enclosing remittance for the same.

Also similar letters from the Register of the Sadar Dewaní, and the Secretary of the College Council of Fort William.

Library.

Read a letter from F. MARCET, Esq., Secretary to the Societé de Physique de Geneve, forwarding vols. 5 and 6 of their Transactions for presentation to the Society, and requesting an interchange of publications.

Read a letter from M. BROUSSE, Secretary to the Royal Academy of Arts, Sciences, &c. at Bordeaux, acknowledging the receipt of vols. 17 and 18, Asiatic Researches, and of a copy of M. CSOMA DE KÖRÖS's Tibetan Dictionary and Grammar, and forwarding for presentation to the Society, a copy of its Transactions from 1819 to 1834, inclusive, 5 vols. handsomely bound.

The Indian Journal of Medical Science, Nos. I and II, for 1836—*by F. Corbyn, Esq.*

Report on the State of Education in Bengal, presented by Messrs. WILLIS and EARLE, on behalf of Rev. Mr. ADAM.

Two copies of a Sketch of the Solar System, translated into Bengálí, by Mahá Rájah KALI KISSEN Behadur, and presented by the translator.

Meteorological Register for December, 1835—*by the Surveyor General.*

Museum.

The Secretary presented on the part of his Excellency General BHIMA SINHA, Minister to the Rájah of Nepál:

Two elaborate drawings of Kathmandu, and of a temple and bridge in the hills. A richly ornamentally *Kukri* and *Khonta:* two large elephant's tusks, and three pods of musk.

A model as large as life, of a native carrying a bullock on his shoulders was presented by *Dr. F. Corbyn.*

Literary and Antiquities.

The Secretary read the following extracts from the correspondence of Mr. VIGNE, from little Tibet and from Cashmír, of which valley this traveller is stated to have made a beautiful series of drawings, and an accurate panoramic view, which will be much prized in Europe.

"*Iskardo*, 10*th September*, 1835.

"I have now been in this very wild and extraordinary place four days, and am pleased with every thing. I set off from Cashmír by boat to Bundurpur, seeing every thing done myself to prevent delay, and took leave of the Governor about 12 o'clock. We had a merry glide of it till night, when the musquitoes became exceedingly numerous and troublesome; arrived at Bundurpur on the great lake the next morning, and heard the agreeable intelligence that a mounted guard of 10 men were awaiting my arrival in AHMAD SHAH'S frontier. I spent the rest of the day in a visit to the Shumladier hill, and the next morning we were fairly off. At that station I was joined by NASIM KHAN, the same man that had eaten your salt for a month and some days, with a letter from AHMAD SHAH. He told me he had been waiting three days in the neighbourhood, not liking to make his appearance among the Sikhs. I like the man much, he is very intelligent and amusing. What a glorious view we had on the second morning, two-thirds of Cashmír and towards Tibet, one mountain in particular of immense height, totally covered with snow from the shoulders upward, named "Diarmul."

"In three days we reached Guress, a very pretty valley, a little higher than Cashmír, entirely surrounded by the loftiest mountains, but bare; merely growing back wheat, vetches, and barley. After leaving Guress, we passed a place which a few men could defend against an army; where the Sikhs and Tibetans fought two days. Further on after passing over a most desolate country, I was met by AHMAD SHAH'S son. I had heard there were some marauders in the neighbourhood, but did not really imagine there was any truth in the account. However, the young Rájah, a very intelligent young fellow, assured me there were, and that his father had sent him to protect me. Imagine the wildness of this scene. Discordant but not altogether unmilitary music gave notice of his approach, and at last, he appeared with some forty sepoys, and led horses. The next morning, we marched in company with him, while the approach of the thieves was hourly expected. They had but one way to come, and when we arrived near the scene of action, I observed parties stationed in different places on the mountains, to prevent all escape. Suddenly an alarm was sounded, and gave notice of their

approach, and the thieves were soon surrounded, and cut up. AHMAD SHAH was there in person. I met him on the field of battle. He said he was so happy at having destroyed the robbers, and seeing me there, that if he were at Iskardo, he did not know what he should do to manifest his joy. We all sat down in a large ring. His sepoys shewing their wounds, and I administered pills, to keep off fever. Of the thieves some returned, 72 killed, 15 escaped ; but I don't think there were so many. They treated the wounded men horribly. The enemy came from the neighbourhood of Peshaur, and were driving off men, women, and cattle. I am delighted with the old Rájah. He appears to have some excellent English ideas about him, and enjoyed the scene amazingly. The book, said to have been written by the old Missionary, does not, he assures me, exist. He shewed me an Armenian Testament that he had bought of some pedlar, which probably gave rise to the report. His faith in the theory of his descent from ALEXANDER is strong. He talks freely of every thing in and about the country, and has sent out men to procure me all kinds of curiosities. We make an excursion to a hot spring on the road to Yarkand in a day or two, and shall have some shikár, &c. I shall quit this extraordinary place, (a vale partly desert, washed by the Attock, a noble stream, quarter mile wide, some 15 miles long, and surrounded by bare rugged mountains on every side, of vast height,) in about 12 days or so: the snow will then begin to fall. I expect a cold march of it. He is very proud of his rock crystal, of which I can bring away as much as I please. As to the productions of the valley, I am making myself fully master of them. He refuses no sort of information. The fort is on a rock covered with alluvial soil, raised in the very centre of the valley, from the bed of what was once most likely a lake. In size, shape, and appearance, washed on two sides of the river, it bears some resemblance to Subathu ; as to the works, a few shells for the wood, and round shot for the stone, would destroy them in a few hours. It would be ridiculous (certain death) to attempt going to Yarkand. Since MOORCROFT was at Ladakh, they have got the picture of an Englishman, so I am assured, painted on the wall, that all who see one may know him. Yarkand is about a month's march—a harkara could go in 12 days. I am going to a classical sort of equestrian sport in a day or two, such as I was happy to hear remarked was played in the time of ISKANDER. It had struck me that the course was precisely the shape of the course of CARACALLA at Rome."

"*Cashmír, 23rd October*, 1835.

"Here I am safe and well ; arrived yesterday after a very severe march of 25 days from Iskardo, over as rough roads, if they deserve the name, as can be seen any where. I have with me four Yáks and all kinds of things. I hope to start hence in about 10 days, and shall come the shortest road to Láhor. So pray oblige me by making some arrangements about the Indus. I should like to hire a boat, men, &c. It must be big enough to carry my Yáks. They are not tall but heavy. I expect Baron HUGEL here in two or three days, and suspect I shall have a very narrow escape of stopping another year in India, but must do every thing I can to get off in time."

"*Cashmír, 30th October*, 1835.

"I wrote to you a few days ago, to mention my safe return, but forget to send the enclosed inscriptions. Pray post them off at your earliest convenience to CSOMA DE KÖRÖS, author of the Tibetan Dictionary, or some person competent to undertake their examination and request a translation, if possible, and soon ; with my compliments. I began my panoramic view from the Tukht

yesterday, the weather continues fine. There is nothing new to communicate, excepting that I hear the Baron is coming the Jammú road, and cannot be far off now. I must be at Bombay by the middle of January."

Of the inscriptions alluded to in the last extract, one at least is in clear Tibetan characters, and will be doubtless easily decyphered by M. CSOMA DE KÖRÖS, to whom they will be sent at Malda.

The Baron HUGEL had deviated from his proposed tour after ascending the pass from Bundurpur to Iskardo into little Tibet, on account of the advanced season; he had since joined M. VIGNE at Láhor.

The Rev. Mr. BATEMAN, in a letter from Bombay, communicated a facsimile of an inscription, supposed to be in Cufic characters, found by Captain THOMAS JERVIS, at the village of *Wara*, in the Southern Konkan; the original stone of which he had presented to the Bombay Literary Society.

The inscription is apparently in the elongated form of Nágarí character, found on the coins of the *Saurashtra* group. (See Journal, vol. iv. Pl. XLIX. p. 684,) and may in time be made out.

Mr. TRAILL, Commissioner of Kemaon, presented further facsimiles of the inscriptions at *Bagéswar*, near Almorah, which were made over to the Rev. Dr. MILL, V. P. for examination.

Read an extract of a private letter from Lieut. A. CUNNINGHAM, Engineers.

Lieut. C. pointed out, in reference to the motto APΔOXPO on one of General VENTURA'S coins (fig. 9 of Pl. XXXVIII. vol. iv.) that the same name might be traced on the coin depicted as fig. 6, Pl. I. vol. xvii. of the Researches, of which he possessed a more legible duplicate: thus forming the most perfect link between the Indo-Scythic and Canouj coins. The cornucopia is borne by both the standing and sitting females of this type.

An anonymous address "to the Members of the Asiatic Society," signed "VERITAS," Hobart Town, Vandieman's Land, September, 1835, developed a new theory of the origin of the *Yugas* of the Hindus, and called upon the Society to examine the subject more closely.

Whatever may be thought of the address, which from its want of authentication cannot be noticed, it is satisfactory to find the Society's Researches made the subject of study in the new colony.

Physical.

Lieut.-Col. COLVIN presented on the part of Lieutenants BAKER and DURAND, three fossils from the Dádupur collection, of great interest.

1. Part of the jaw of a rhinoceros, with two milch teeth attached.
2. The molar tooth of a camel; of which new fossil genus, they possess now the entire head. (See Journal for December, 1835.)
3. A very distinct head of a fish.

To these Colonel COLVIN added, on his own part, four fragments of the fossil shell of a tortoise, of gigantic dimensions.

The same officer presented on the part of Lieutenant BAKER, a series of the fossil shells from the stratum of blue marl, underlying hard sand, gravel, and yellow sand, inclined at an angle of 45° in the low range of hills at the head of the Delhí Canal. A sketch of the strata accompanied.

A note from Mr. B. H. HODGSON called the Society's attention to a paper

and drawing of a new species of *Columba*, submitted to the Society several years since, of which by some inadvertence no notice had been taken.

A duplicate of the article was now furnished.

It appears that the bird is described as new by the Zoological Society in 1832, thus depriving the author here of the priority of discovery and publication.

Specimens of Cinnyris Mahrattensis and Rynchœa Capensis—presented by M. Bouchez.

A specimen of Raia Thouriniana—presented by Captain Lloyd, Indian Navy.

Specimens of Squalus Zygœna and Maximus—presented by Mr. F. Shaw, of the Surveying Vessel *Flora*.

A collection of skins of birds, of snakes, fishes, Crustacea and Mollusca—presented by Lieut. Montriou, Indian Navy, and Mr. F. Shaw.

This collection was received only a few days ago but the following genera and species have been determined.

Birds, the Genera, Dicrurus, Ardea, and Carbo: *Snakes*, Dryinus and Hydrophis: *Fishes*, Trichiurus, Polynemis, Golieides, Pleuronectes, Tetradon, Clupea, Chanda, and Pimelodes: *Crustacea*, Sepia, Loligo, and Monoculus: *Shells*, Balanus, Pholas, Psammotea, Arca, Cardium, Cytherea, Venus, Cerithium, Turritella, Pyrula, Nerita, Neritina, Ampullaria, Dolium, Cassis, Oliva, Rotella, and Calyptrœa.

Of these genera, the following species have been ascertained: Dicrurus Indicus, Trichiurus Argenteus, Polynemus Paradiseus, Golieides Rubicunda, Pleuronectes Pan, Tetradon Patoca, Clupea Aclara, Chanda Ruconius, Pimelodes Etor; Monoculus Polyphemus; Balanus Striatus, Pholas Orientalis, Cerithium Telescopium, and Sulcatum; Pyrula Vespertilio, Dolum Pomum, and Cassis Areola.

The Python Amethystina, presented some months ago by Mr. Cheine, died during the very cold weather of last month. He changed his skin at the beginning of December, and refused to eat afterwards; remaining in a semi-torpid condition till the coming on of the (for this country) extreme cold of the middle of January.

A collection of skins of birds—presented by W. D. Smith, Esq.

A memoir by Messrs. Falconer and Cautley, on the peculiarities of two new species of fossil Hippopotamus, found in the *Siwálik* range, was read.

The great distinction between the Hippopotamus of the *sub-Himálayas* and the fossils described by Cuvier, and also the existing animal of South Africa, consists in its having six incisor teeth, in lieu of four. This marked difference has led the authors to a subdivision of the genus into *Hexaprotodon* and *Tetraprotodon*. The former comprising the two or more varieties hitherto discovered in India, in a fossil state. Their account will appear in the outcoming volume of the Physical Researches.

A series of Geological specimens from the Shekhawáti country, were presented by Mr. Falconer.

A memoir on a Geological collection made in the country between Hyderabad and Nagpur, and presented to the Society by the collector, Dr. Malcolmson, with a descriptive map, was submitted.

[This will shortly be published in the Journal.]

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of January, 1836.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer, at 32°.	Wet Barometer, at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold 2 ft. above ground	Heat in sun.		Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.
1	29,020			67,0	10,0			,930			71,2	11,5			51,8	82,2		n.	n.	n.	clear.	clear.	clear.
2	,008	,322	0,686	68,5	5,1	5,3	95	,917	,184	,733	70,2	5,1	5,2	93	52,2	85,0		n.	ne.	ne.	do	hazy.	cumuli.
3	,060			65,2	6,2			,980			73,1	11,1			52,3	85,4		nw.	n.	n.	do	do	clear.
4	,056	,370	,686	68,5	5,3	5,3	89	,938	,188	,750	71,1	6,4	6,0	88	52,8	85,3		w.	ne.	ne.	do	clear.	do
5	,042	,332	,710	69,4	4,8	4,7	92	,925	,181	,744	70,7	7,7	7,2	84	55,2	82,2		o.	ne.	ne	do	hazy.	cumuli.
6	,019	,347	,672	68,3	5,7	6,0	88	,914	,180	,734	70,5	8,8	8,9	79	51,5	83,2		sw.	nw.	nw.	do	clear.	clear.
7	,020	,347	,673	68,1	7,2	7,8	82	,893	,184	,709	69,6	8,0	8,2	81	54,2	78,3		o.	ne.	nw.	cirri.	fine.	do
8	,032	,396	,636	66,6	8,4	8,7	78	,912	,235	,677	68,3	8,6	8,9	78	50,1	77,3		w.	nw.	nw.	do	clear.	do
9	,078	,448	,630	65,6	8,9	6,9	84	,970	,284	,686	67,7	9,9	9,6	74	45,4	76,4		o.	nw.	nw.	clear.	do	do
10	,018			63,7	9,2			,960			68,5	5,3			46,5	77,4		n.	n.	n.	do	do	do
11	,048	,420	,620	65,6	8,0	7,0	84	,914	,248	,662	67,3	10,5	9,9	74	44,2	79,1		o.	nw.	nw.	do	do	do
12	,017			63,8	10,8			,924			70,6	16,8			44,4	77,8		o.	n.	n.	fog.	do	do
13	,980	,341	,639	65,9	9,9	8,3	79	,899	,228	,671	67,8	9,6	8,2	72	50,3	83,2		n.	nw.	nw.	do	do	do
14	,036	,398	,638	65,6	7,6	8,0	81	,918	,218	,700	68,6	10,4	12,3	67	46,3	81,4		o.	nw.	n.	do	do	do
15	,062	,440	,622	65,7	8,6	9,0	77	,946	,289	,657	67,3	9,0	10,9	70	47,5	76,2		o.	nw.	nw.	cirri.	do	do
16	,088	,498	,590	64,1	8,8	8,0	79	,928	,296	,632	66,3	13,5	12,6	67	43,2	74,8		n.	nw.	nw.	clear.	do	do
17	,120			56,	11,2			,995			65,5	15,5			41,7	71,0		o.	nw.	n.	foggy.	do	do
18	,056	,496	,560	62,9	10,9	12,0	70	,949	,348	,601	64,9	13,7	12,4	68	39,8	73,8		o.	nw.	n.	do	do	do
19	,088	,548	,540	62,3	8,1	7,4	83	,949	,338	,611	65,2	12,3	11,5	74	40,6	73,8		ne.	nw.	nw.	fog.	do	do
20	,008	,436	,572	63,3	7,3	7,3	84	,906	,284	,622	65,3	9,6	11,2	75	41,4	80,8		o.	nw.	n.	do	do	do
21	,026	,436	,590	63,9	6,1	6,3	88	,912	,249	,663	67,0	8,3	9,3	81	45,4	84,7		o.	n.	n.	do	hazy.	do
22	,043			66,4	3,7			,972			71,5	14,3			49,0	82,5		o.	o.	W.	do	clear.	do
23	,050			65,7	9,7			,983			70,5	15,5			46,2	83,4		o.	n.	n.	do	do	do
24	,083			69,1	11,1			,900			72,0	7,5			47,0	82,5		o.	o.	sw.	do	do	cumuli.
25	,086	,449	,637	65,6	5,8	6,0	89	,986	,295	,691	67,7	10,2	11,7	72	49,6	86,2		o.	W.	nw.	clear.	do	clear.
26	,085	,458	,627	65,7	7,7	7,9	84	,979	,258	,721	69,1	12,9	12,8	72	45,9	83,7		do	W.	sw.	do	do	do
27	,099	,460	,639	65,9	6,3	7,2	88	,984	,260	,724	69,4	8,8	10,2	79	46,8	85,6		E.	W.	w.	cloudy.	hazy.	do
28	,111	,416	,695	68,5	4,7	5,1	94	,984	,158	,826	72,9	7,3	8,0	89	51,0	86,8		NW.	sw.	sw.	clear.	cumuli.	cumuli.
29	,128	,426	,702	69,3	2,6	2,2	97	,008	,180	,828	73,1	5,0	5,0	94	51,2	86,5		ne.	se.	w.	fog.	hazy.	clear.
30	,135	,386	,749	70,7	6,7	7,2	85	,019	,196	,823	73,3	6,8	7,3	86	58,8	89,5		ne.	nw.	w.	clear.	fine.	do
31	,143			70,7	7,4			,930			78,7	11,3			57,0	89,0		E.	o.	o.	do	do	do
Mean,	29,060	0,417	0,641	65,9	7,5	7,0	85	,946	,240	0,703	68,8	10,0	9,4	78	48,3	81,5							

This has been the coldest month experienced in India for a very long period. On the night of the 18th, ice was naturally formed in the Botanical garden—it was plentiful in Tirhut and other places to the north.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 50.—*February*, 1836.

I.—*Account of Rumbówe, one of the States in the Interior of Malacca. By Lieut.* J. F. Newbold, *23rd Regt. Madras Native Infantry.*

Rumbówe has generally been accounted by the Portuguese and Dutch Governments at Malacca as the principal of the states in the interior; but their ideas, like our own, until of late years, of the relative situation of these states, both political and geograpical, appear to have been very erroneous. At the present time, indeed, much interesting matter remains in obscurity, and must remain until the peninsula has been more thoroughly explored.

These notions of the superiority of *Rumbówe* over the sister state arose probably from the circumstances of its proximity to, and early connexion with, *Naning;* and from that of its capital being the crowning place of the deputed sovereign from *Menangkábówe.*

Tradition ascribes its name to a large *Marabówe* tree, anciently growing near its western frontier, on one of the banks of the *Marabówe* stream, not far from its embouchement into the *Rumbówe* branch of the Lingie river.

There was a small hamlet here, when I visited the place in 1832, consisting of four or five Malay houses. The word *Marabówe* is supposed to have been corrupted into *Rumbówe.*

The area of *Rumbówe proper,* not including the dependencies, is said not to be quite so spacious as that of *Naning.* The nearest point of its frontier is distant about 25 miles N. W. from the town of Malacca.

Boundaries.—It is bounded towards the N. E. by *Sríminánti* and *Súngie Ujong;* towards the south, by part of *Naning* and *Johóle;* to the west, by part of *Naning* and *Salengore,* and to the east, by part of *Sríminánti* and *Johóle.*

The boundary marks with *Sríminánti* are the mountains of *Lépat, Cájang*, and *Gúnong tûjoh;* with *Súngie Ujong, Búkit Augim*, part of the right branch of the *Lingie* river, and *Parentian tingih*; with *Naning*;* with *Johóle*, the hill of *Búkit Pábeí;* and with *Salangore*, the *Lingie* river.

Rumbówe contains two divisions, viz. *Rumbówe Ulú* and *Rumbówe Ilír;* each under its four *Súkús*, who are all subject to the control of one *Panghúlú*.

The *Lingie* river forms the channel of communication, by water, of *Rumbówe* with the straits of Malacca, into which it falls about eight miles to the eastward of *Cape Rachádo*. This river is about 450 yards broad, and takes a north-by-easterly course into the interior, to the distance of about six miles, when it divides into two branches. The one to the left, called *Battang Pennar*, goes up to *Lingie*, and the *Súngie Ujong* tin mines, taking a N. W. by N. course; and the one to the right, called *Battang Penágie*, takes a N. E. by E. course, to *Bander*, in *Rumbówe*. It has its rise among the mountains of this state. The three principal posts of *Rumbówe* are situated on the banks of *Battang Penágie;* viz. *Sempong*, six miles from the mouth at the point of the river's bifurcation; *Padás*, on the right bank, five or six miles further up; and *Bander*, about eight miles beyond *Padás*.

The river, up to *Sempong*, is navigable for vessels of 125 tons, ranging from $3\frac{1}{2}$ to 7 fathoms, high-water, and vessels of nine tons may pass up, without much difficulty, to *Padás;* and to *Lingie*, on the other branch.

In entering the mouth of the river care must be taken to avoid the eastern bank, in consequence of hidden rocks, which run off to sea. The channel near the western bank is deep and safe.

Regarding *Padás*, the following remarks are extracted from some notes taken during a trip up the river in 1833. Two or three miles in advance of *Ramoan China Kechil*, on the right bank of the river, on the summit of a small hill commanding it, is *Rája* Ali's (the *Iang de pertúan Besár*) stockaded house. The place is named *Padás*, from a small stream that flows into the river about a quarter of a mile nearer *Sempong*. The river, several hundred yards above and below *Padás*, had been partially blocked up by large trees felled completely across. In one place we passed through a formidable chevaux de frise of pointed stakes, bound together, and running from bank to bank.

On this part of the river the stockade bears most: it is most judiciously placed to annoy an enemy passing up with so many obstacles in his course. We contrived to get over them with consi-

* See paper on Naning, vol. IV. 297.

derable difficulty, although the trees had since been cut in two, and broken down. At high-water, they might however be readily passed. The river was blockaded in this fashion during the *Naning* disturbances, and the engineer on this occasion was no other than our friend in the boat, the *Laks-amána* of *Rumbówe*. *Sempong*, as before stated, is situated at the point of the river's bifurcation. In 1833, it consisted only of two or three huts; in the foremost of which was a small battery, consisting of seven swivels, and an iron 3-pr. of sufficient range to command both branches of the river. It is the place selected by the *Rumbówe* chiefs to levy the duty on the tin passing down from *Súngie Ujong*.

At the close of 1833, and commencement of 1834, many fugitives settled here, in consequence of the disturbances at *Lingie*, together with a small colony from Sumatra, under a *Panglíma* named *Kammer*. The place is now strongly stockaded by the *Iang de pertúan Múda* Sayad Saban, by whom every encouragement is held out to settlers.

Population.—Rumbówe, including *Kroh* and *Tamping*, contains about 9,000 inhabitants. The principal places are *Bander*, *Sempong*, *Chembong*, *Kaling*, and *Battu Ampar*. *Chembong*, with its environs, is said to contain about 600 houses, and drives a petty trade in timber, dammer, and wax, which are bartered for opium, cloths, iron utensils, and tobacco.

Chembong is the residence of the *Panghúlú* of *Rumbówe*; *Bander*, *Padás*, and *Sempong* those of the *Iang de pertúans*.

Besides Malays are several aboriginal tribes inhabiting the steeps of the mountains, and the forests, who subsist principally by hunting. The natives give them the general appellation of *Orang Benúa*, people of the soil or country.

They are subdivided into several tribes: among the most remarkable of which are the *Udái*, *Sakkye*, *Jakún*, and *Rayet Utan*. I have seen several specimens of the two last, but do not perceive any material dissimilarity between them, save that the latter, by enjoying freer intercourse with the Malays, have become more civilized; at least, as far as a shew of dress and ornaments is implicated.

They differ much from the descriptions given of the *Semang* in the interior of *Quedah*, and the thick-lipped, woolly-haired *Papúan*. Their features are of the Malay caste; their hair sometimes straight, like that of the generality of Asiatics, but more frequently curling; at the same time, very different from the frizzly locks of the African.

Their stature is shorter, but they do not differ much in complexion from the Malay.

The Malays entertain a high estimation of the skill of those singular tribes in medicine, and the knowledge of the virtues of herbs, roots,

plants, &c. investing their sages, *Púyongs*, even with supernatural powers, such as the *Túju Besawye*, &c.

These tribes are to be found over the whole of the interior of this part of the peninsula, particularly in *Ulú Colang*, *Súngie Ujong*, *Johóle*, *Jompóle*, *Jellabu*, *Ulú Múar*, and *Segúmet*. They are skilled in the composition of the celebrated upas poison, with which they tip the points of their arrows. The *Súmpitan*, a long tube, through which the poisoned darts are blown, and a spear, are their favorite weapons. The cloth that encircles their loins is made from the fibrous bark of the *Terrap* tree.

The influence of their *Botins*, or chiefs over the election of the *Panghúlú* of *Súngie Ujong*, has been mentioned. In *Johóle*, they exert a similar power. It may be also remarked here, that in *Rumbówe* there are two distinctions of the high Malayan tribe called *Bódoánda*, viz. *Bódoánda Jakún*, and *Bódoánda Jawa*. The *Panghúlús* of all these states must necessarily be of one of these two tribes.

Government.—*Rumbówe* was formerly under the immediate sway of its *Panghúlú* and *Ampat Súkú;* but of latter days, the *Iang de pertúan Múda* claims equal, if not superior power to the *Panghúlú*.

The first chief who assumed the title of *Iang de pertúan Múda* of *Rumbówe* was *Rája* Assil, the son of the second *Menangkábówe* prince *Rája* Adil; he was appointed by the then *Iang de pertúan Besár* (his son-in-law *Rája* Itam), with the concurrence of the *Panghúlús* of the four states; and it is stated, had assigned to him, as a subsistence, two-sixths of the duty levied on the tin passing down the river from *Súngie Ujong*, (the duty was then 2 dls. per *bhar*,) and the revenues of the districts of *Kroh* and *Tampin*, near the foot of the mountain of that name.

In 1812, Assil was driven out of *Rumbówe*, as previously mentioned, by the *Panghúlú* and *Súkús*, assisted by Rája Ali; and died in Naning in 1814 or 15. Rája Ali supplanted him; but, being elected as *Iang de-pertúan Besár* in 1832, was succeeded in the *Múda*-ship by his son-in-law, the present chief, Sayad Saban.

This office being an innovation on ancient usage is, consequently, secretly disliked by the Malays, especially where its privileges are so ill defined and unsettled; and one in which right would appear synonymous with might.

Another change within the last few years has taken place in the constitution of this state; instead of the council of the *Ampat*, or four, *Súkús*, it consists now of eight, or the *Súkú Iang de-lápan;* who, with the *Panghúlú*, now form a deliberative body, like the Archons of Athens, of nine.

The *Panghúlú* is alternately elected from the two tribes, *Bódoánda Jakún* and *Bódoánda Jawa*. The following circumstances, according to tradition, led to this custom:

"When the king of *Johore* appointed nine *Panghúlús* over the nine *Negris* in the interior of Malacca, the heads of the leading tribes in *Rumbówe*, viz. those of the *Bódoánda Jakún* and *Jawa*, disputed regarding the superiority of their respective claims to the honor. His Highness of Johore, after due deliberation, came to the decision that the selection of a *Panghúlú* should not be made from one tribe exclusively, but that each should have the privilege alternately."

This judgment, we are assured, gave entire satisfaction, and at all events, seems to have been adhered to in subsequent elections.

It must not be omitted here to state, that the title of *Lélah Máhárája* was given by the king to the *Panghúlús* of the tribe *Bódoánda Jakún*, and that of *Sédia Rája* to those of the *Bódoánda Jawa;* with the exception of this custom, the office of *Panghúlú* is hereditary, agreeably to the law of *Perpáti Sabátang* prevailing in *Menangkábówe*, and provided the heir be not insane or an imbecile. The present *Panghúlú* is of the tribe *Bódoánda Jakún*, he succeeded his predecessor *Bahágo*, of the tribe *Bódoánda Jawa*, in 1819.

Súkús.—Under the *Panghúlú* are the eight *Súkús*, or heads of the tribes, into which the population of *Rumbówe* is divided; and who act as their representatives in councils of state, where like the former *Súkús* of *Naning* and *Súngie Ujong*, they possess considerable influence. Nothing of any public importance can be agreed on without their concurrence; and their unanimous vote on disputed points bears down that of the *Panghúlú*. The *Iang de-pertúan Besár* and *Múda* always exert more or less influence over their councils. The signature of the *Súkús* is necessary to the ratification of any treaty, or other similar public document.

Formerly there were only four *Súkús* who had share in the councils, viz. those of *Rumbówe Ilir;* but latterly those of *Rumbówe Ulú* have been admitted, as alluded to above. This change was effected by the policy of the two *Iang de-pertúans*, in order to lessen the influence of the *Panghúlú* and former *Súkús*, and to increase their own.

The names of the tribes and titles of the individuals who represent them are as follow:

Rumbówe Ilir.		*Rumbówe Ulú.*	
Tribes.	*Heads of tribes.*	*Tribes.*	*Heads of Tribes.*
Báttu Ampar, ...	Gompar Mahárája.	Paya Kúmba Dárrat, ...	Sáma Rája.
Paya Kúmba Barrat, ..	Méra Bongsa.	Báttu Bállang, ...	Andika.
Mancal, ...	Sangsúra Páhláwan.	Sa Melongang, ...	Mendalíka.
Tiga Nénik, ...	Bongsa de Bálang.	Sri Lummah, ...	Senda Mahárája.

To this list may be added the names of four inferior tribes, which

being scanty in number, and most of them of foreign origin, are represented by the heads of the more important tribes, viz. *Tiga, Battu, Anak Malacca, Anak Achi,* (children of Malacca and Achin,) and *Tannah Dattar.* The *Bódoánda* tribes are represented by the *Panghúlús.*

Malays, strangers to *Rumbówe,* while residing there, are amenable to the head of the tribe to which they belong. Settlers are immediately classed in their respective tribes. Those from *Menangkábówe* generally enter that of *Báttu Ampar,* which is the principal of the five tribes that originally emigrated from Menangkábowe; viz. those of *Muncal, Báttu Ballang, Tiga Báttu, and Tannah Dattar.*

A man marrying into another tribe becomes a member of that of the woman, as also the children.

Some of the tribes have peculiar privileges; it is said that the *Bódoándas,* though guilty of the highest crimes, are exempt from capital punishment; banishment and fines being the only penalty to which they are liable. The circumstance of the *Panghúlús* of the independant states being necessarily *Bódoándas* has already been adverted to*.

Although the Malays, like the Greeks and Romans, entertain the highest veneration for old age, still the claims of descent supersede those conferred by years, particularly with regard to the heads of tribes, who have precedence in the councils of the state, conformably to the rank of the tribe they represent. An instance of this, and the power sometimes exercised by the *Súkús* in election, fell under my own observation. At *Súngie Sipát,* on the frontier of *Rumbówe,* in 1833, among the assembly of Malay chiefs there, I observed a boy, whose dress and weapons betokened some rank, and to whom a considerable degree of deference was shewn by the natives. On inquiring, I found him to be the head of the principal tribe, and that, although a younger brother, he had been elected by the *Súkús* as the head of his tribe or clan, in consequence of his elder brother's imbecility. This boy affixed his name, or rather his mark, (for neither he nor any of his seven compeers could write,) immediately after the *Panghúlú* of *Rumbówe,* before the rest of the *Súkús,* some of whom were venerable old men, and grown grey in office.

Mantris.—There are two *Mantris* in *Rumbówe,* viz. Suroh Rája, and Andika *Mantri,* both of the tribe *Bódoánda Jawa.*

Their functions are ill defined, but are principally, I believe, to assist the chiefs with their advice.

* The division of the people of these states into tribes, some of which bear the names of places in Menangkábówe, is a strong additional proof of their origin.

They have no vote in councils, and their influence must be almost entirely personal.

Laksámana.—The *Laksámanas* are also two, PASSAR and KHATIB. The navigation of the river and maritime matters are entrusted to these officers.

Panglímas.—The war-chiefs, or *Panglímas*, are four in number, viz. two *Panglíma Prangs*, PANDIKA *Rája*, and *Panglíma Dallam*. Their duties are similar to those of the former *Panglímas* of *Naning*.

Pertáma.—There is another officer, appointed by the *Iang de pertúan Besár*, whose functions, fortunately for the liege subjects of *Rumbówe*, are seldom called into exercise. This is the *Pertáma*, or executioner. The modes of putting criminals to death are generally confined to the *Panchong* "تنجع" and *Sálang* "سالع".

The former is decapitation: the latter has been already described.

Passing up the *Rumbówe* river, on some high ground on the left bank between *Sempong* and *Pádas*, a leafless, blighted tree was pointed out to me by one of the *Laksámanas* who stated the foot of it to be the place where criminals, subjects of *Rumbówe*, were put to death by *Sálang* "سالع".

Religion.—The inhabitants of *Rumbówe*, like those of the other states of the interior, with the exception of the aborigines, profess the tenets of *Islám*. They are divided into seven *Múkuns*, or parishes, to each of which is attached a mosque, with distinct establishments of priests, as in Naning.

A Kázi named HA'JI HASHIM Sri LUMMAH presides over the whole. The religious customs, fasts, and festivals are similar to those observed in *Naning*.

Visit to Rumbówe.—As *Rumbówe* has seldom been penetrated by Europeans, the following memoranda, from my note book, of a visit paid to the chiefs at its capital, *Bander*, in 1832, by the then Governor of the Straits, the Honorable Mr. IBBETSON, and Brigadier WILSON, C. B. may not perhaps be wholly devoid of interest.

Early on the morning of the 21st October, I joined from camp at *Alorgajeh*, the Governor's suite at *Tábu*, the principal village of *Naning*, and late the residence of the ex-*Panghúlú* DHOLL SAYAD.

After breakfasting under one of the thatched quarters that had escaped the pioneer's axe and brand on the late evacuation of this outpost, the party started on horseback along a foot-path, through a wooded country with the *Rumbówe* hills on the right, to *Chirána pútih*, the last village of Naning. This was formerly a populous place. And the residence of the ex-*Panghúlú's* sons, but we found it now entirely deserted, and its houses falling into rapid decay and ruin. Here it was

stated that Dholl Sayad had a manufactory for gun-powder during his late resistance to the Company's troops.

Leaving *Chirána pútih* to the left, the path abruptly turns to the right, over or rather through a muddy *sáwah*, and leads towards the foot of *Gúnong Tampin*. Along the skirt of this mountain, through a dense forest, the party had to travel in Indian file, the narrow foot-path being in several places blocked up by large forest trees lying across to *Qabar Feringí*, or the Frank's grave, which is a mere mound in the jungle. This is one of the boundary marks of the *Rumbówe* and *Naning* territories, and is traditionally said to be the grave of a Portuguese officer, slain by the natives in one of those frequent skirmishes which took place between the followers of the gallant Albuquerque and the "rebellious *Menangkábówes*." The path to *Cóndóng*, from *Qabar Feringí*, lay through the jungle at the foot of the *Rumbówe* range, and gradually improved as we approached that village. *Cóndóng* is a populous hamlet, the first in the *Rumbówe* side of the boundary line, and is situated at the foot of the mountain of *Gúnong Rumbówe*, on whose steep sides, amidst luxuriant forests, appeared singular patches of partially cleared ground, and a few rude huts, the habitation of the lords of the woods and rocks, the *Jakúns*. None of their sylvan eminences however, nor their attendant Hamadryades, condescended to favor the party with their appearance.

From *Cóndóng* to *Pádang Lóko*, the forest decreased in size and denseness, and here and there were traces of clearing and cultivation. A few small verdant patches, not deserving the name of plains, and two or three rivulets, were passed through. The distance from *Cóndóng* to *Pádang Lóko* is about three miles.

From *Pádang Lóko* to *Lágon*, the road is bad, passing for the most part over heavy rice-grounds. The cultivation increased progressively as the belt of forest, the natural boundary between *Naning* and *Rumbówe*, was left behind, until we reached the banks of the *Rumbówe* river at *Lágon*. This stream was just fordable; its waters muddy, and evidently swoln by the rains.

After passing by a miserable path over a very extensive and well cultivated sheet of rice-ground, where the horses were frequently up to the saddle flaps in mud, fording another stream, and crossing a broad swampy plain, from the grassy tufts of which flew the startled lapwing and whistling plover, the cavalcade halted before the mud fort of *Bander*. From its gate issued a motley crowd of well-dressed Malays, brandishing spears, muskets, *pemurasses*, (a sort of blunderbuss,) and umbrellas of state, white and yellow, headed by the *Múda* of *Rumbówe*, and one of the sons of the *Iang de pertúan Besár*, Rája Ali.

The Governor, and Brigadier WILSON, were received by these chiefs with every demonstration of welcome and respect, conducted into the fort, and ushered by Rája ALI into a large temporary building, apparently erected for the occasion, opposite the Rája's primitive palace of thatch.

A salute from the fort jinjals was then fired, much to the discomfiture of one of the pieces, which, possibly from not being accustomed to powder, burst into divers rust-incrusted fragments.

Refreshments were served in, on a large flat tray; they consisted principally of dried fruits, dates, conserves, and sweetmeats, in which, as usual, sugar and oil were manifestly predominant. These were placed on small China dishes, and a number of minute cups of the same material, filled with the steaming infusion of Souchong, fresh from China, sans sucre et sans lait, were warmly pressed upon us.

In the evening, Rája ALI introduced two antique ladies, dressed with almost more than Spartan simplicity. The one his mother, the Princess Dowager TUÁNKU PUTIH, and the other, his venerated kinswoman, his aunt. These ogresses of high degree would have rivalled in flow of language and exuberance of gesticulation the most vivacious dowagers, date 1770, Madame DU DEFFAND always excepted.

TUÁNKU PUTIH is represented to be a woman of strong masculine mind, and to have considerable influence over her son Rája ALI.

The fort of *Bander* consists of low mud walls, now covered with grass, inclosing a space of ground about 80 yards square.

Around and outside of the walls runs a strong and high palisade. Six high cavaliers of wood, roofed in with *atap*, overlook the faces of the work. On each of their platforms two iron guns are mounted, except on that over the gate-way, where there is a serviceable brass gun, bearing the mark of the Dutch East India Company; the date 1756, A. D. and the maker's name, PETER SEEST.

Besides the 12 guns in the cavaliers, were 18 or 20 jinjals lying about the parapets. The houses of the Rája and his personal attendants are within the area comprised by the fort walls.

After passing the night on mattresses and pillows, covered with dirty red silk, embroidered in gold, and which had evidently been abstracted from the *Zenána*, the party left *Bander* early on the following morning.

The Governor and Brigadier WILSON proceeded en route to Malacca viâ *Pádas* and the *Lingie* river. Lieut. BALFOUR, of the Madras Artillery, and myself, returned by *Brissú*, to camp, which we reached the same evening.

Sayad Sában, the present *Iang de pertúan Múda* of *Rumbówe*, is the son of an Arab named Sayad Ibrahim by his concubine Sri Kamis, a Malay slave girl, a *Khána-záda* of Zain-ud-Din, formerly *Capitan Maláyu* in Malacca. He is a native of *Chembong* in *Rumbówe*, whither his father, a rigid zealot, had proceeded to promulgate and expound the tenets of the Korán.

His son, Sayad Sában, principally resided in *Rumbówe*, but occasionally at Malacca. Being naturally ambitious, he early sought to connect himself by marriage with the ruling families in *Rumbówe*, and *Siac*, in Sumatra. He first married a daughter of the *Iang de pertúan Múda* of Jállabu, Rája Sabun, a son of the second *Menangkábówe* prince, Rája Adil. He then crossed the straits, and obtained the hand of one of the *Siac* chief's daughters. His next matrimonial connexions were with Rája Ali's family.

Sayad Sában is young, active, and intriguing; but at prcsent well disposed to the British Government. Without the bigotry of his father he entertains a thorough contempt for the apathetic opium-eating Malay chiefs, his colleagues in power. He has a taste for war, and proved of great service in placing his father-in-law, Rája Ali, over the heads of his competitors. His activity both for and against the troops in the *Naning* expeditions are well known.

By his own talents and address, the religious influence of his father, and from his Arab extraction, a circumstance to which the Malays invariably pay great deference and respect, and his high connexions, in the securing of which he has shewn great tact and forethought, this adventurer has risen to the *Múda*-ship of *Rumbówe*, and is now aspiring to the entire sovereignty of the states in the interior.

Bennie, the present *Panghúlú* of *Rumbówe*, is an elderly, grave person, with an unpleasing cast of features purely Malayan. He is at heart inimical to the claims of the *Múda* and Rája Ali. During the disturbances at *Lingie*, in 1833, he shamefully deserted his stockade, leaving it with several guns, and a quantity of ammunition, in the hands of the vassal chief Kátas; not without being strongly suspected of having received a considerable bribe for this piece of treachery. He assisted the ex-*Panghúlú* of *Naning* during the time he was in arms against Government. Bennie is addicted to opium-eating, and like other Malays of this class, is not, as experience has shewn, proof against the temptations of a bribe coming in the shape of this fascinating drug.

Among the *Súkús*, few are men of any talent or worthy of any particular notice. Pakkat, an aspirant to the *Panghúlú*-ship, and Suroh

Rája, one of the *Mantris*, are much looked up to by the Malays, with whom their opinions and councils have considerable influence.

I had an opportunity of hearing a very long improviso speech from the latter of these Malayan Ciceros, at *Súngie Sipat*, on the boundary question. His position, unlike that of European orators, was a squatting one, on his hams, with the knees pliantly folded in front. The style of his address, like that of the generality of Asiatics, was grave and pompous; but the flow of his words easy and unbroken, except by a few little attentions bestowed on his betel-pounder *(Gobik)*, by which his right-hand was kept in almost continual motion.

The speech, however, was so long, that the *Panghúlú* of *Rumbówe* was fairly snoring before the customary *Ah, bagítu lah!* announced the finale of the effusion. Touching the gift of eloquence, I have observed that the Malays of the interior have generally a better and freer manner of expressing themselves than those of the coast; the language in which they clothe their sentiments is far more figurative, and full of metaphors, drawn from natural objects, and cannot fail to strike the hearer as highly pleasing and simply poetical. Their popular traditions are seldom put to writing, being committed to memory by some of their elders, and sometimes by old Malay ladies of rank, who are regarded by the simple natives, much in the light of a casket containing a valuable gem. Many of their customs are singular and peculiar, and deserving of more attention than has hitherto been paid them.

II.—*Quotations from Original Sanscrit Authorities in proof and illustration of Mr.* Hodgson's *Sketch of Buddhism.*

[Continued from page 38.]

Quotations.

The Swábhávika Doctrine.

1. All things are governed or perfected by *Swabháva**: I too am governed by *Swabháva*. (*Ashta Sahasrika.*)

2. It is proper for the worshipper at the time of worship to reflect thus: I am *Nirlipt*†, and the object of my worship is *Nirlipt;* I am that God *(Iswara)* to whom I address myself. Thus meditating, the worshipper should make *puja* to all the celestials: for example, to *Vajra Satwa Buddha*, let him pay his adorations, first, by recollecting that all things with their *Vija mantras* came from *Swabháva* in this or-

* *Swa*, own, and *bháva*, nature. Idiosyncrasis.

† Intact and intangible, independent.

der:—from the *vija** of the letter Y, air; from that of the letter R, fire; from that of the letter V, or B, water, and from that of the letter L, earth; and from that of the letter S, Mount *Sumèrú*. On the summit of *Sumèr* is a lotos of precious stones, and above the lotos, a moon crescent, upon which sits, supremely exalted, *Vajra Satwa*. And as all (other) things proceed from *Swabháva*, as also does *Vajra Satwa*, thence called the self-existent†. (*Pujá kand.*)

3. All things and beings (in the versatile universe) which are alike perishable, false as a dream, treacherous as a mirage, proceed, according to some, from *Swabháva*, (nature,) and according to others, from God, *(Iswara;)* and hence it is said, that *Swabháva* and *Iswara* are essentially one, differing only in name‡. (*Ashta Sahasrika.*)

4. At the general dissolution of all things, the four elements shall be absorbed in *Súnyákár-Akásh* (sheer space) in this order: Earth in water, water in fire, fire in air, and air in *Akásh*, and *Akásh* in *Súnyáta*, and *Súnyáta* in *Tathata*§, and *Tathata* in *Buddha*, (which *Mahá Súnyáta*‖) and *Buddha* in *Bhávana*, and *Bhávana* in *Swabháva*. And when existence is again envolved, each shall in the inverse order, progress from the other. From that *Swabháva*, which communicates its property of infinity to *Akásh*, proceeded into being, in *Akásh*, the letter A. and the rest of the letters; and from the letters, *Adi Buddha*¶ and the other *Buddhas;* and from the *Buddhas*, the *Bodhi-Satwas*, and from them the five elements, with their *Vija Mantras*. Such is the *Swabhávika Sansár;* which *Sansár* (universe) constantly revolves between *Pravritti* and *Nirvritti*, like a potter's wheel. (*Divya Avadán.*)

* Root, radix, seed.

† This may teach us caution in the interpretation of terms. I understand the dogma to announce, that infinite intelligence is as much a part of the system of nature as finite. The mystic allusion to the alphabet imports nothing more than its being the indispensable instrument and means of knowledge or wisdom, which the *Buddhists* believe man has the capacity of perfecting up to the standard of infinity.

‡ See the note on No. 3, on the *Yatnika* system.

§ *Tathata*, says the comment, is *Satya Juyan;* and *Bhávana* is *Bháva* or *Satta*, i. e. sheer entity.

‖ See note on quotation 1 of the section *A'di Buddha*.

¶ Here again I might repeat the caution and remark at quotation 2. I have elsewhere observed, that *Swábhávika* texts, differently interpreted, form the basis of the *Aiswarika* doctrine, as well as that the *Buddhas* of the *Swábhávikas*, who derive their capacity of identifying themselves with the first cause from nature, *which is that cause*, are as largely gifted as the *Buddhas* of the *Aiswarikas*, deriving the same capacity from *A'di Buddha*, who *is that cause*. See remarks on Remusat apud Journal of Bengal Asiatic Society, Nos. 32, 33, and 34.

5. *Mahá Súnyáta* is, according to some, *Swabháva*, and, according to others, *Iswara;* it is like the ethereal expanse, and self-sustained. In that *Mahá Súnyáta*, the letter A, which the *Vija Mantra* of *Upáya**, and the chief of all the *Vija Mantras* of the letters, became manifest. (*Rucha Bhágavati.*)

6. Some say creation is from God: if so, what is the use of *Yatna* or of *Karma* †? That which made all things, will preserve and destroy them; that which governs *Nirvritti*, governs *Pravritti* also. (*Buddha Charitrakávya.*)

7. The sandal tree freely communicates its fragrance to him who tears off its bark. Who is not delighted with its odour? It is from *Swabháva.* (*Kalpalata.*)

8. The elephant's cub, if he find not leafless and thorny creepers in the green wood, becomes thin. The crow avoids the ripe mango‡. The cause is still *Swabháva.* (Do.)

9. Who sharpened the thorn? Who gave their varied forms, colours, and habits to the deer kind, and to the birds? *Swabháva!* It is not according to the will *(ichchha)* of any; and if there be no desire or intention, there can be no intender or designer§. (*Buddha Charitra.*)

10. The conch, which is worthy of all praise, bright as the moon, rated first among excellent things, and which is benevolent to all sentient beings, though it be itself insensate, yields its melodious music, purely by reason of *Swabháva.* (*Kalpalata.*)

11. That hands and feet, and belly and back, and head, in fine, organs of whatever kind, are found in the womb, the wise have attri-

* *Upaya*, the expedient, the energy of nature in a state of activity. See the note on No. 6, of the section *A'di Sangha.*

† See the note on quotation 9 of this head. *Yatna* and *Karma* may here be rendered by intellect and morality.

‡ These are assumed facts in Natural History; but not correct.

§ Here is plainly announced that denial of self-consciousness or personality in the causa causarum which constitutes the great defect of the *Swabhávika* philosophy: and if this denial amount to atheism, the *Swabhávikas* are, for the most part, atheists; their denial also of a moral ruler of the universe being a necessary sequel to it. Excepting, however, a small and mean sect of them, they all affirm eternal necessary entity; nor do any of them reject the soul's existence beyond the grave, or the doctrine of atonement. Still Newton's is, upon the whole, the right judgment, 'Deus sine providentia et dominio nihil est nisi fatum et natura.' The *Swábhávika* attempts to deify nature are but a sad confusion of cause and effect. *But*, in a serious religious point of view, I fail to perceive any superiority possessed by the immaterial pantheism of Bráhmans over the material pantheism of the *Buddhists.* Metempsychosis and absorption are common to both.

buted to *Swabhâva;* and the union of the soul or life *(A'tma)* with body, is also *Swabhâva.* (*Buddha Charitra Kâvya.*)

12. From *Swabhâva* (nature) all things proceeded; by *Swabhâva* all things are preserved. All their differences of structure and of habits are from *Swabhâva:* and from *Swabhâva* comes their destruction. All things are regulated *(suddha)* by *Swabhâva. Swabhâva* is known as the Supreme. (*Pujá kand,*—from the *Rucha Bhágavati,* where the substance is found in sundry passages).

13. *Akâsh* is *Swâbhâvika,* because it is established, governed, perfected *(suddha)* by its own force or nature. All things are absorbed in it: it is uncreated or eternal; it is revealed by its own force; it is the essence *(A'tma*)* of creation, preservation, and destruction; it is the essence of the five elements; it is infinite; it is intellectual essence *(Bodhanâtmika).* The five colours are proper to it; and the five *Buddhas;* and the letters. It is *Sûnyâta*; self-supported; omnipresent: to its essence belong both *Pravritti* and *Nirvritti.* This *Akâsh,* which is omnipresent, and essentially intellectual†, because infinite things are absorbed into it, is declared to be infinite. From the infinite nature of this *Akâsh* were produced all moving things, each in its own time, in due procession from another, and with its proper difference of form and habits. From the secret nature of *Akâsh* proceeded likewise, together with the *Vij Mantra* of each one, air with its own mobility; and from air, fire with its own heat; and from fire, water with its intrinsical coldness; and from water, earth with its own proper solidity or heaviness; and from earth, Mount *Sumèru* with its own substance of gold, or with its own sustaining power *(Dhâtwâtmika);* and from *Sumèru,* all the various kinds of trees and vegetables; and from them, all the variety of colours, shapes, flavours, and fragrances, in leaves, flowers, and fruits. Each derived its essential property (as of fire to burn) from itself; and the order of its procession into existence from the one precedent, by virtue of *Swabhâva,* operating in time. The several manners of going peculiar to the six classes of animate beings (four-legged, two-legged, &c.), and their several modes of birth, (ovi-

* One comment on the comment says, *A'tma* here means *sthân* or *álaya,* i. e. the *ubi* of creation, &c.

† *Akâsh* is here understood as synonymous with *Sûnyâta,* that is, as the elemental state of all things, the universal ubi and modus of primal entity, in a state of abstraction from all specific forms: and it is worthy of note, that amidst these primal principles, intelligence has admission. It is therefore affirmed to be a necessary end, or eternal portion of the system of nature, though separated from self-consciousness or personality. In the same manner, *Prâjna,* the sum of all things, Diva natura, is declared to be eternal, and essentially intelligent, though a material principle.

parous, &c.*) all proceeded from *Swabhâva*. From the *Swabhâva* of each mansion or habitat *(Bhavana)* resulted the differences existing between the several abodes of all the six orders of animate beings. The existence of the fœtus in the womb proceeds from the *Swabhâva* of the union of male and female; and its gradual growth and assumption of flesh, bones, skin, and organs, is caused by the joint energy of the *Swabhâva* of the fœtus, and that of time, or the *Swabhâva* of the fœtus, operating in time. The procession of all things from birth, through gradual increase, to maturity; and thence, through gradual decay, to death, results spontaneously from the nature of each being; as do the differences appropriated to the faculties of the senses and of the mind, and to those external things and internal, which are perceived by them. Speech and sustenance from dressed food in mankind, and the want of speech and the eating of grass in quadrupeds, together with the birth of birds from eggs, of insects from sweat, and of the Gods *(Devatás)* without parentage of any sort: all these marvels proceed from *Swabhâva*, (Comment on the *Pujá kand*, quotation 12.)

The Aiswarika *System.*

1. The self-existent God is the sum of perfections, infinite, eternal, without members or passions; one with all things (in *Pravritti)*, and separate from all things (in *Nirvritti)*, infiniformed and formless, the essence of *Pravritti* and of *Nirvritti*†. (*Swayambhú Purána.*)

2. He whose image is *Súnyáta*, who is like a cypher or point, infinite, unsustained (in *Nirvritti*), and sustained (in *Pravritti*), whose essence is *Nirvritti*, of whom all things are forms (in *Pravritti*), and who is yet formless (in *Nirvritti*), who is the *Iswara*, the first intellectual essence, the *A'di Buddha*, was revealed by his own will. This self-

* By etcætera, understand *always* (more Bráhmanorum). That *Buddhism* forms an integral part of the Indian philosophy is sufficiently proved by the multitude of terms and classifications common to it, and to Bráhmanism. The theogony and cosmogony of the latter are expressly those of the former, with sundry additions only, which serve to prove the posteriority of date, and schismatical secession, of the *Buddhists*. M. Cousin, in his course of philosophy, notices the absence of a sceptical school amongst the Indian philosophers. *Buddhism*, when fully explained, will supply the desideratum; and I would here notice the precipitation with which we are now constantly drawing general conclusions relative to the scope of Indian speculation, from a knowledge of the Bráhmanical writings only—writings equalled or surpassed in number and value by those of the *Budddists*, *Jains*, and other dissenters from the existing orthodox system of *Vyása* and *Sankara A'chárya.*

† *Pravritti*, the versatile universe; *Nirvritti*, its opposite, this world and the next. *Pravritti* is compounded of *Pra*, an intensitive, and *vritti*, action, occupation, from the root *vá*, to blow as the wind; *Nirvritti*, of *Nir*, a privative, and *vritti*, as before.

existent is he whom all know as the only true Being; and, though the state of *Nirvritti* be his proper and enduring state, yet, for the sake of *Pravritti*, (creation), having become *Pancha-jnyánátmika*, he produced the five *Buddhas* thus; from *Suvi-suddha-dharma-dhátuja jnyán*, *Vairo chana*, the supremely wise, from whom proceed the element of earth, the sight, and colours; and from *Adarshana-jnyán*, *Akshobhya*, from whom proceed the element of water, the faculty of hearing, and all sounds; and from *Pratyavekshana-jnyán*, *Ratna Sambhava*, from whom proceed the element of fire, the sense of smell, and all odours; and from *Samta-jnyán*, *Amitábha*, from whom proceed the element of air, the sense of taste, and all savours; and from *Krityanushtha-jnyán*, *Amogha Siddha*, from whom proceed the element of *ether*, the faculty of touch, and all the sensible properties of outward things dependent thereon. All these five *Buddhas* are *Pravritti kámang*, or the authors of creation. They possess the five *jnyans*, the five colours, the five *mudras*, and the five vehicles*. The five elements, five senses, and five respective objects of sense, are forms of them†. And these five *Buddhas* each produced a *Bodhi-Satwa*, (for the detail, see Asiatic Society's Transactions, vol. xvi.) The five *Bodhi-Satwas* are *Srishti-kámang*, or the immediate agents of creation; and each, in his turn, having become *Sarvaguna*, (invested with all qualities, or invested with the three *gunas*,) produced all things by his fiat. (Comment on quot. 1.)

3. All things existent (in the versatile universe) proceed from some cause (*hétu*): that cause is the *Tathágata*‡ (*Adi Buddha*); and that

* See Appendix A.

† The five *Dhyani Buddhas* are said to be *Pancha Bhúta*, *Pancha Indriya*, and *Pancha Ayatan ákar*. Hence my conjecture that they are mere personifications, according to a theistic theory of the phænomena of the sensible world. The 6th *Dhyáni Buddha* is, in like manner, the icon and source of the 6th sense, and its object, or *Manasa* and *Dharma*, i. e. the sentient principle, soul of the senses, or internal sense, and moral and intellectual phænomena. In the above passage, however, the association of the five elements is not the most accredited one, which (for example) associates hearing and sounds to *Akásh*.

‡ This important word is compounded of *Tatha*, thus, and *gata*, gone or got, and is explained in three ways. 1st, thus got or obtained, viz. the rank of a *Tathágata*, obtained by observance of the rules prescribed for the acquisition of perfect wisdom, of which acquisition, total cessation of births is the efficient consequence. 2nd, thus gone, viz. the *mundane* existence of the *Tathágata*, gone so *as never to return*, mortal births having been closed, and *Nirvritti* obtained, by perfection of knowledge. 3rd, gone in the same manner as it or they (birth or births) came; the sceptical and necessitarian conclusion of those who held that both metempsychosis and absorption are beyond our intellect (as objects of knowledge), and independent of our efforts (as objects of desire and aversion—as contingencies to which we are liable); and that *that* which causes births, causes

which is the cause of (versatile) existence is the cause of the cessation or extinction of all (such) existence: so said *Sákya Sinha.* (*Bhadra Kalpavadan.*)

4. Body is compounded of the five elements: soul, which animates it, is an enamation from the self-existent. (*Swayambhu purána.*)

5. Those who have suffered many torments in this life, and have even burned in hell, shall, if they piously serve the *Tri Ratna* (or *Triad*), escape from the evils of both. (*Avadán Kalpalatá.*)

6. Subandu (a Rája of Benares) was childless. He devoted himself to the worship of *Iswara* (*A'di Buddha*); and by the grace of *Iswara* a sugar-cane was produced from his semen, from which a son was born to him. The race* remains to this day, and is called Ikshava Aku. (*Avadán Kalpalatá.*)

likewise (proprio vigore) the ultimate cessation of them. The epithet *Tathágata*, therefore, can only be applied to *A'di Buddha*, the self-existent, who is never incarnated, in a figurative, or at least a restricted, sense;—cessation of human births being the essence of what it implies. I have seen the question and answer, 'what is the *Tathágata?* It does not come again,' proposed and solved by the *Raksha Bhagavatí*, in the very spirit and almost in the words of the *Vedas*. One of a thousand proofs that have occurred to me how thoroughly Indian *Buddhism* is. *Tathágata*, thus gone, or gone as he came, as applied to *A'di Buddha*, alludes to his voluntary secession from the versatile world into that of abstraction, of which no mortal can predicate more than that his departure and his advent are *alike* simple results of his volition. Some authors substitute this interpretation, exclusively applicable to *A'di Buddha*, for the third sceptical and general interpretation above given. The synonyme *Sugata*, or 'well gone, for ever quit of versatile existence,' yet further illustrates the ordinary meaning of the word *Tathágata*, as well as the ultimate scope and genius of the *Buddhist* religion, of which the end is, freedom from metempsychosis; and the means, perfect and absolute enlightenment of the understanding, and consequent discovery of the grand secret of nature. What that grand secret, that ultimate truth, that single reality, is, whether all is God, or God is all, seems to be the sole propositum of the oriental philosophic religionists, who have all alike sought to discover it by taking the high priori road. That God is all, appears to be the prevalent and dogmatic determination of the Bráhmanists; that all is God, the preferential but sceptical solution of the *Buddhists;* and, in a large view, I believe it would be difficult to indicate any further essential difference between their theoretic systems, both, as I conceive, the unquestionable growth of the Indian soil, and both founded upon transcendental speculations, conducted in the very same style and manner.

* That of *Sákya Sinha*, and said by the *Buddhists* to belong to the solar line of Indian Princes. Nor is it any proof of the contrary, that the *Pauránika* genealogies exhibit no trace of this race. Those genealogies have been altered again and again, to suit current prejudices or partialities. The Bráhmans who

7. When all was void, perfect void, (*Súnya, Mahá Súnya*) the triliteral syllable *Aum* became manifest, the first created, the ineffably splendid, surrounded by all the radical letters (*Vijá Akshara*), as by a necklace. In that *Aum*, he who is present in all things, formless and passionless, and who possesses the *Tri Ratna*, was produced by his own will. To him I make adoration. (*Swayambhu purána*).

The Kármika System.

1. From the union of *Upáya* and *Prajná**, arose *Manas*, the lord of the senses, and from *Manas* proceeded the ten virtues and the ten vices; so said *Sákya Sinha*. (*Divya Avadan.*)

2. The being of all things is derived from belief, reliance, (*pratyaya,*) in this order: from false knowledge, delusive impression; from delusive impression, general notions; from them, particulars; from them, the six seats (or outward objects) of the senses; from them, contact; from it, definite sensation and perception; from it, thirst or desire; from it, embryotic (physical) existence; from it, birth or actual physical existence; from it, all the distinctions of genus and species among animate things; from them, decay and death, after the manner and period peculiar to each. Such is the procession of all things into existence from *Avidya*, or delusion: and in the inverse order to that of their procession, they retrograde into non-existence. And the egress and regress are both *Karmas*, wherefore this system is called *Kármika*. (*Sákya* to his disciples in the *Racha Bhagavatí.*)

3. The existence of the versatile world is derived sheerly from fancy or imagination, or belief in its reality; and this false notion is the first *Karma* of *Manas*, or first act of the sentient principle, as yet unindividualized? and unembodied. This belief of the unembodied sentient principle in the reality of a mirage is attended with a longing after it, and a conviction of its worth and reality; which longing is called *Sanscár*, and constitutes the second *Karma* of *Manas*. When *Sanscár* becomes excessive incipient individual, consciousness arises (third *Karma*); thence proceeds an organised and definite, but archetypal body, the seat of that consciousness, (fourth *Karma*;) from the last results the existence of [the six sensible and cognizable properties of] natural† objects, moral and physical, (fifth *Karma*.) When the

obliterated throughout India every vestige of the splendid and extensive literature of the *Buddhas*, would have little scruple in expunging from their own sacred books the royal lineage of the great founder of *Buddhism*.

* See the note on quotation 6 of the section *A'di Sangha*. Also the note on quotation 1 of the *Yatnika* system.

† So I render, after much inquiry, the *Shad Ayatan*, or six seats of the senses external and internal; and which are in detail as follows: *Rupa, Savda, Ganda,*

archetypally embodied sentient principle comes to exercise itself on these properties of things, then definite perception or knowledge is produced, as that this is white, the other, black; this is right, the other wrong, (sixth *Karma.*) Thence arises desire or worldly affection in the archetypal body, (seventh *Karma,*) which leads to corporeal conception, (eighth,) and that to physical birth, (ninth.) From birth result the varieties of genus and species distinguishing animated nature, (tenth *Karma,*) and thence come decay and death in the time and manner peculiar to each, (eleventh and final *Karma.*) Such is the evolution of all things in *Pravritti;* opposed to which is *Nirvritti,* and the

Rasa, Sparsa, Dharma. There is an obvious difficulty as to *Sparsa,* and some also as to *Dharma.* The whole category of the *Ayatans* expresses *outward* things: and after much investigation, I gather, that under *Rupa* is comprised not only colour, but form too, so far as its discrimination (or, in *Kármika* terms, its existence) depends on sight; and that *all* other *un*specified properties of body are referred to *Sparsa,* which therefore includes not only temperature, roughness, and smoothness, and hardness, and its opposite, but also gravity, and even extended figure, though not extension in the abstract.

Here we have not merely the secondary or sensible properties of matter, but also the primary ones; and, as the *existence* of the *Ayatans* or outward objects perceived, is said to be derived from the *Indriyás,* (or from *Mánas,* which is their collective energy,) in other words, to be derived from the sheer exercise of the percipient powers. Nor is there any difficulty thence arising in reference to the *Kármika* doctrine, which clearly affirms that theory by its derivation of all things from *Pratyaya* (belief), or from *Avidya* (ignorance). But the *Indriyás* and *Ayatáns,* with their *necessary connexion,* (and, possibly, also, the making *Avidya* the source of all things,) belong likewise to one section at least of the *Swabhávika* school; and, in regard to it, it will require a nice hand to exhibit this Berkleyan notion existing co-ordinately with the leading tenet of the *Swabhávikas.* In the way of explanation I may observe, first, that the denial of material entity involved in the *Indriyá* and *Ayatán* theory (as in that of *Avidya*) respects solely the versatile world of *Právritti,* or of specific *forms merely,* and does not touch the *Nirvrittiká* state of formative powers and of primal substances, to which latter, in that condition, the qualities of gravity, and even of extended figure, in any sense cognizable by human faculties, are denied, at the same time, that the real and even eternal existence of those substances, in that state, is affirmed.

Second, though *Dharma,* the sixth *Ayatán,* be rendered by virtue, the appropriated object of the internal sense, it must be remembered, that most of the *Swabhávikas,* whilst they deny a moral ruler of the universe, affirm the existence of morality as a part of the system of nature. Others again (the minority) of the *Swabhávikas* reject the sixth *Indriya,* and sixth *Ayatán,* and, with them, the sixth *Dhyáni Buddha,* or *Vajrá Satwa,* who, by the way, is the *Magnus Apollo* of the *Tántrikás,* a sect the mystic and obscene character of whose ritual is redeemed by its unusually explicit enunciation and acknowledgment of a "God above all."

The published explanations of the procession of all things from *Avidya* appear to me irreconcilably to conflict with the ideal basis of the theory.

recurrence of *Nirvritti* is the sheer consequence of the abandonment of all absurd ideas respecting the reality and stability of *Pravritti*, or, which is the same thing, the abandonment of *Avidya:* for, when *Avidya* is relinquished or overcome, *Sanscára* and all the rest of the *Karmas* or acts of the sentient principle, vanish with it; and also, of course, all mundane things and existences, which are thence only derived. Now, therefore, we see that *Pravritti* or the versatile world is the consequence of affection for a shadow, in the belief that it is a substance; and *Nirvritti* is the consequence of an abandonment of all such affection and belief. And *Pravritti* and *Nirvritti*, which divide the universe, are *Karmas;* wherefore the system is called *Kármika.* (Comment on Quotation 2.)

4. Since the world is produced by the *Karma* of *Manas*, or sheer act of the sentient principle, it is therefore called *Kármika.* The manner of procession of all things into existence is thus. From the union of *Upáya* and of *Prájna, Manas* proceeded; and from *Manas, Avidya;* and from *Avidya, Sanscár;* and from *Sanscár, Vijnyána;* and from *Vijnyána, Námarúpa;* and from *Námarúpa,* the *Shad Ayatan*;* and from them, *Vedana;* and from it, *Trishna;* and from it, *Upadán;* and from it, *Bhava;* and from it, *Jati;* and from it, *Jaramarana.* And from *Játirupya Manas,* (i. e. the sentient principle in organized animate beings) emanated the ten virtues and ten vices. And as men's words and deeds partake of the character of the one or the other, is their lot disposed, felicity being inseparably bound to virtue, and misery to vice, by the very nature of *Karma.*

Such is the procession of all things into existence from *Manas* through *Avidyá;* and when *Avidyá* ceases, all the rest cease with it. Now, since *Avidyá* is a false knowledge, and is also the medium of all mundane existence, when it ceases, the world vanishes; and *Manas,* relieved from its illusion, is absorbed into *Upáya Prajna*†. *Pravritti* is the state of things under the influence of *Avidyá;* and the cessation of *Avidyá* is *Nirvritti: Právritti* and *Nirvritti* are both *Karmas.* (Another comment on quotation 2.)

* i. e. colour, odour, savour, sound, the properties dependent on touch, (which are hardness, and its opposite, temperature, roughness and smoothness, and also I believe gravity and extended figure,) and lastly, right and wrong. They are called the seats of the six senses, the five ordinary, and one internal. In this quotation I have purposely retained the original terms. Their import may be gathered from the immediately preceding quotations and note, which the curious may compare with Mr. Colebrooke's explication. See his paper on the *Bauddhy* philosophy, apud Trans. Roy. As. Socy. quarto vol.

† The *Vámáchára*s say into *Prajna Upáya:* see note on quotation 6 of the section *A'di Sangha.*

5. The actions of a man's former births constitute his destiny*. *(Punya paroda.)*

6. He who has received from nature such wisdom as to read his own heart, and those of all others, even he cannot erase the characters which *Vidhátri*† has written on his forehead. *(Avadan Kalpalatá.)*

7. As the faithful servant walks behind his master when he walks, and stands behind him when he stands, so every animate being is bound in the chains of *Karma*. (Ditto.)

8. *Karma* accompanies every one, every where, every instant, through the forest, and across the ocean, and over the highest mountains, into the heaven of *Indra*, and into *Pátála* (hell); and no power can stay it. (Ditto.)

9. KANÁL, son of king ASOKA', because in one birth he plucked out the golden eyes from a *Chaitya*‡, had his own eyes plucked out in the next; and because he in that birth bestowed a pair of golden eyes on a *Chaitya*, received himself in the succeeding birth eyes of unequalled splendour. *(Avadan Kalpalatá.)*

10. SA'KYA SINHA'S son, named RA'HULA BHADRA, remained six years in the womb of his mother YASODRÁ. The pain and anxiety of mother and son were caused by the *Karmas* of their former births. (Ditto.)

11. Although I had required (*Sákya* speaks of himself) a perfect body, still, even in this body, defect again appeared; because I had yet to expiate a small residue of the sins of former births. *(Lallita Vistara.)*

The Yátnika System.

1. *Iswara (A'di Buddha)* produced *Yatna* from *Prajna*§; and the cause of *Pravritti* and *Nirvritti* is *Yatna*; and all the difficulties that

* *Daivyá*, identified with *A'di Buddha* by the theistic, and with Fate, by the atheistic doctors. The precise equivalent of the maxim itself is our 'conduct is fate.'

† *Bramha*, but here understood to be *Karma*.

‡ *Chaitya* is the name of the tomb temples or relic-consecrated churches of the *Buddhists*. The essential part of the structure is the lower hemisphere: above this a square basement or *Toran* always supports the acutely conical or pyramidal superstructure, and on all four sides of that basement two eyes are placed. Wherever the lower hemisphere is found, is indisputable evidence of *Buddhism*, e. g. 'the topes' of *Manikálaya* and of *Peshawar*. In niches at the base of the hemisphere are frequently enshrined four of the five *Dhyáni Buddhas*, one opposite to each cardinal point. *Akshobhya* occupies the eastern nich; *Ratna sambhava*, the southern; *Amitabha*, the western, and *Amoghasiddha*, the northern. *Vairochana*, the first *Dhyáni Buddha*, is supposed to occupy the centre, invisibly. Sometimes, however, he appears visibly, being placed at the right-hand of *Akshobhya*.

§ This, as I conceive, is an attempt to remedy that cardinal defect of the older *Swábhávika* school, viz. the denial of personality, and conscious power and wisdom in the first cause. To the same effect is the *Karmika* assertion,

occur in the affairs of this world and the next are vanquished by *Yatna* (or conscious intellectual effort). *(Divya Avadan.)*

2. That above mentioned *Iswara*, by means of *Yatna*, produced the five *Jnyáns*, whence sprang the five *Buddhas*. The five *Buddhas*, in like manner, (i. e. by means of *Yatna*,) produced the five *Bodhi satwas:* and they again, by the same means, created the greater *Devatás* from their bodies, and the lesser ones, from the hairs of their bodies. In like manner, Brahma' created the three *Lokas** and all moving and motionless things. Among mortals, all difficulties are overcome by *Yatna;* for example, those of the sea by ships, those of illness by medicine, those of travelling by equipages—and want of paper, by prepared skin and bark of trees. And as all our worldly obstacles are removed by *Yatna*, so the wisdom which wins *Nirvritti* for us is the result of *Yatna;* because by it alone are charity and the rest of the virtues acquired. Since therefore all the goods of this world and of the next depend upon *Yatna*, Sa'kya Sinha wandered from region to region to teach mankind that cardinal truth. (Comment on Quotation 1.)

3. That *A'di Buddha*, whom the *Swabhávikas* call *Swabháva*, and the *Aiswárikas*, *Iswara*†, produced a *Bodhi satwa*, who, having migrated through the three worlds, and through all six forms of animate existence, and experienced the goods and evils of every state of being, appeared, at last, as *Sákya Sinha*, to teach mankind the real sources of happiness and misery, and the doctrines of the four schools of philosophy‡; and then, by means of *Yatna*, having obtained *Bodhi-jnyán*, and having fulfilled all the *Páramitás* (transcendental virtues), he at length became *Nirván*. *(Divya Avadán.)*

4. Sa'kya Sinha, having emanated from that self-existent which, according to some, is *Swabháva*, and according to others, is *Iswara*, was produced for the purpose of preserving all creatures. He first adopted the *Pravritti Márga* (secular character), and in several births exercised *Yatna* and *Karma*, reaping the fruits of his actions in all the three worlds. He then exercised *Yatna* and *Karma* in the *Nirvritti*

that Manas proceeded from the union of *Upáya* and *Prájna*. *Karma* I understand to mean conscious moral effort, and *Yatna*, conscious intellectual effort. Their admission in respect to human nature implies its *free will*, as their assignation to the divine nature implies its *personality*.

* The celestial, terrene, and infernal divisions of the versatile universe.

† Passages of this entirely pyrrhonic tenure incessantly recur in the oldest and highest authorities of the *Buddhists;* hence the assertion of the preface that Sugatism is rather sceptical than atheistically dogmatic.

‡ Expressly called in the comment the *Swobhávika*, *Aiswárika*, *Yatniká*, and *Kármika* systems. I find no authority in *Sangata* books for the Brahminical nomenclature of the *Bauddha* philosophical schools.

Márga (ascetical or monastic character) essaying a release from this mortal coil, fulfilling the ten virtues from the *Satya* to the *Dwápara Yuga*, till at last, in the *Kali Yuga*, having completely freed himself from sublunary cares, having become a *Bhikshuka**, and gone to *Buddh Gyá*, he rejected and reviled the Bráhmanical penance, did all sorts of true penance for six years under the tree of knowledge on banks of the *Niranjana* river; conquered the *Namuchimara*†, obtained *Bodhi-jnyán*, became the most perfect of the *Buddhas*, seated himself among the *Bodhi satwas*, (*Ananda* '*Bhikshu*' and the rest,) granted wisdom to the simple, fulfilled the desires of millions of people, and gave *Moksha*‡ to them and to himself. (*Lallita Vistára.*)

5. A hare fell in with a tiger: by means of *Yatna* the hare threw the tiger into a well. Hence it appears that *Yatna* prevails over physical force, knowledge, and the *Mantras*. (*Bhadra Kalpavadan.*)

6. Nara Sinha (Rája of Benares) was a monster of cruelty. Satta Swáma *Rája*, by means of *Yatna*, compelled him to deliver up 100 *Rájkumárs*, whom Nara Sinha had destined for a sacrifice to the gods. (*Bhadra Kalpavadan.*)

7. Sudhana Kumára found a beautiful daughter of a horse-faced Rája named Dru'ma. By means of *Yatna* he carried her off, and kept her; and was immortalized for the exploit. (*Swayambhu Purána.*)

A'di Buddha.

1. Know that when, in the beginning, all was perfect void (*Mahá-sunyáta*§), and the five elements were not, then *A'di Buddha*, the stainless, was revealed in the form of flame or light.

* Mendicant: one of the four regular orders of the *Bauddhas*.—See the Preface.

† A *Daitya* of *Kánchanapara*, personification of the principle of evil. *Bodhi-jnyán* is the wisdom of *Buddhism*. Ananda was one of the first and ablest of Sa'kya's disciples. The first *code* of *Buddhism* is attributed to him.

‡ Emancipation, absorption.

§ The doctrine of *Sunyáta* is the darkest corner of the metaphysical labyrinth. 18 kinds of *Sunyáta* are enumerated in the *Raksha Bhagavati*. I understand it to mean generally space, which some of *our* philosophers have held to be plenum, others a vacuum. In the transcendental sense of the *Buddhists*, it signifies not merely the universal *ubi*, but also the *modus existendi* of all things in the state of quiescence and abstraction from phænomenal being. The *Buddhists* have eternised matter or nature in *that* state. The energy of nature ever *is*, but is not ever *exerted*; and when not *exerted*, it is considered to be void of all those qualities which necessarily imply perishableness. Most of the *Buddhists* deem (upon different grounds) all phænomena to be as purely illusory as do the Vedantists. The phænomena of the latter are sheer energies of God; those of the former are sheer energies of Nature, deified and substituted for God. See note on quot. *A'di Sangha*. The *Aiswarikas* put their *A'di Buddha* in place of the nature of the older *Swobhávikas*. See Journal of As. Soc. No. 33, Art. 1.

2. He in whom are the three *gunas*, who is the *Mahá Múrti* and the *Visvarúpa* (form of all things), became manifest: he is the self-existent great *Buddha*, the *A'di náth*, the *Mahèswara*.

3. He is the cause of all existences in the three worlds; the cause of their well being also. From his profound meditation *(Dhyán)*, the universe was produced by him.

4. He is the self-existent, the *Iswara*, the sum of perfections, the infinite, void of members or passions: all things are types of him, and yet he was no type: he is the form of all things, and yet formless.

5. He is without parts, shapeless, self-sustained, void of pain and care, eternal and not eternal*; him I salute. (*Káranda Vyúha.*)

6. *A'di Buddha* is without beginning. He is perfect, pure within, the essence of the wisdom of thatness, or absolute truth. He knows all the past. His words are ever the same.

7. He is without second. He is omnipresent. He is *Nairatmya* lion to the *Kútirtha* deer†. (*Nam sangiti.*)

8. I make salutation to *A'di Buddha*, who is one and sole in the universe; who gives every one *Bodhi-jnyán;* whose name is *Upáya;* who became manifest in the greatest *Sunyáta*, as the letter A. Who is the *Tathagata;* who is known only to those who have attained the wisdom of absolute truth. (Ditto.)

9. As in the mirror we mortals see our forms reflected, so *A'di Buddha* is known (in *Pravritti*) by the 32 *lakshanas* and 80 *anuvinjanas*. (Ditto.)

10. As the rainbow, by means of its five colours, forewarns mortals of the coming weather, so does *A'di Buddha* admonish the world of its good and evil actions by means of his five essential colours‡. (Ditto.)

* One in *Nirvritti;* the other in *Pravritti;* and so of all the preceding contrasted epithets. *Nirvritti* is quiescence and abstraction: *Pravritti*, action and concretion. All the schools admit these two modes, and thus solve the difficulty of different properties existing in cause and in effects.

† Comment says, that *Nairatmya* is '*Sarva Dharmanám nirabhás lakshanang;*' and that *Tirtha* means *Moksha*, and *Kútirtha*, any perversion of the doctrine of *Moksha*, as to say it consists in absorption into *Brahm:* and it explains the whole thus, 'He thunders in the ears of all those who misinterpret *Moksha*, there is no true *Moksha*, but *Sunyáta.*' Another comment gives the sense thus, dividing the sentence into two parts, 'There is no *atma* (life or soul) without him: he alarms the wicked as the lion the deer.' The first commentator is a *Swobhávika;* the second, an *Aiswarika* one.

‡ White, blue, yellow, red, and green, assigned to the five *Dhyani Buddhas.*

For a detail of the *lakshanas*, *anuvinjanas*, *balas*, *basitas*, &c. of the neighbouring quotations, see Appendix A.

11. *A'di Buddha* delights in making happy every sentient being; he tenderly loves those who serve him. His majesty fills all with reverence and awe. He is the assuager of pain and grief. (Ditto.)

12. He is the possessor of the 10 virtues; the giver of the 10 virtues: the lord of the 10 heavens; lord of the Universe: present in the 10 heavens. (Ditto.)

13. By reason of the 10 *jnyáns*, his soul is enlightened. He too is the enlightener of the 10 *jnyáns*. He has 10 forms and 10 significations, and 10 strengths, and 10 *basitas*. He is omnipresent, the chief of the *Munis*. (Ditto.)

14. He has five bodies, and five *juyáns*, and five sights; is the *múkat* of the five *Buddhas*, without partner. (Ditto.)

15. He is the creator of all the *Buddhas*: the chief of the *Bodhi-satwas* are cherished by him. He is the creator of *Prajná*, and of the world; himself unmade. *Aliter*, he made the world by the existence of *Prajná*; himself unmade. He is the author of virtue, the destroyer of all things*. (Ditto.)

16. He is the essence of all essences. He is the *Vajra-átma*. He is the instantly-produced lord of the universe; the creator of *Akásh*. He assumes the form of fire, by reason of the *Prajnya-rupi-jnyán*, to consume the straw of ignorance. (Ditto.)

A'di Prajná, or Dharma.

1. I salute that *Prájná Paramitá*, who by reason of her omniscience causes the tranquillity-seeking *Srávakas*† to obtain absorption; who, by her knowledge of all the ways of action, causes each to go in the path suited to his genius, of whom wise men have said, that the external and internal diversities belonging to all animate nature, as produced by her, who is the mother of *Buddha (Buddha Mátra)* of that *Buddha* to whose service all the *Srávakas* and *Bodhi-satwas* dedicate themselves. (*Panchavingsati Sahasrika.*)

2. First air, then fire, then water, then earth‡, and in the centre of earth, *Suméru*, the sides of which are the residence of the 33 millions

* The comment on this passage is very full, and very curious, in as much as it reduces many of these supreme deities to mere *parts of speech*. Here is the summing up of the comment: 'He *(A'di Buddha)* is the instructor of the *Buddhas* and of the *Bodhi-satwas*. He is known by the knowledge of spiritual wisdom. He is the creator and destroyer of all things, the fountain of virtue.' Spiritual wisdom is stated to consist of *Sila*, *Samádhi*, *Prájná*, *Vimúkhti*, and *Jnyán*.

† Name of one of the ascetical orders of *Buddhists*. See Preface.

‡ In this enumeration of material elements, *Akásh* is omitted: but it is mentioned, and most emphatically, in quo. 4, as in the 50 other places quoted. In

of gods *(Devatás)*, and above these, upon a *Lotos* of precious stones, sustaining the mansion of the moon (or a moon-crescent) sits *Prájná Paramita*, in the *Lallita-ásan* manner* ; *Prájná*, the mother of all the gods (*Prasú-bhagavatáng*), and without beginning or end, *(anádyant.) (Bhadra Kalpavadán.)*

3. I make salutation to the *Prájná Deví*, who is the *Prájná Paramita*, the *Prájná rupa*, the *Nir rupa*, and the universal mother. *(Puja kand.)*

4. Thou *Prájná* art, like *Akásh*, intact and intangible ; thou art above all human wants ; thou art established by thy own power. He who devoutly serves thee serves the *Tathágata* also. (*Ashta Sahasrika.*)

5. Thou mighty object of my worship ! thou *Prájná*, art the sum of all good qualities ; and *Buddha* is the *Gúrú* of the world. The wise make no distinction between thee and *Buddha*. (*Ashta Sahasrika.*)

6. O thou who art merciful to thy worshippers, the benevolent, knowing thee to be the source of *Bauddha* excellence, attain perfect happiness by the worship of thee ! (Ditto.)

7. Those *Buddhas* who are merciful, and the *Gúrús* of the world, all such *Buddhas* are thy children. Thou art all good, and the universal mother *(Sakaljagat Pitá Mahi)*. (Ditto.)

8. Every *Buddha* assembling his disciples instructs them how from unity thou becomest multiformed and many named. (Ditto.)

9. Thou comest not from any place, thou goest not to any place. Do the wise nowhere find thee† ? (Ditto.)

10. The *Buddhas*, *Pratyéka Buddhas*, and *Srávakas*‡, have all devoutly served thee. By thee alone is absorption obtained. These are truths revealed in all *Shástras*. (Ditto.)

11. What tongue can utter thy praises, thou of whose being (or manifestation) there is no cause by thy own will. No *Purána* hath revealed any attribute by which thou mayest certainly be known. (Ditto.)

12. When all was *Sunyáta*, *Prájná Deví* was revealed out of *Akásh* with the letter U ; *Prájná*, the mother of all the *Buddhas* and *Bodhisatwas*, in whose heart *Dharma* ever resides ; *Prájná*, who is without the world and the world's wisdom, full of the wisdom of absolute truth :

like manner, the five elements are frequently mentioned, without allusion to the 6th, which however occurs in fit places. Omission of this sort is no denial.

* i. e. one leg tucked under the other, advanced and resting on the bow of the moon-crescent.

† The force of the question is this, the wise certainly find thee.

‡ The *Buddhas* are of three grades : the highest is *Mahá Yána*, the medial, *Pratyéka*, and the lowest, *Sraváka*. These three grades are called collectively the *Tri-Yána*, or three chariots, bearing their possessors to transcendental glory.

the giver and the ikon of that wisdom; the ever living (*Sanatani*); the inscrutable; the mother of *Buddha**. (*Pujá kand.*)

13. O *Prájná Dévi!* thou art the mother (*Janani*) of all the *Buddhas*, the grandmother of the *Bodhi-satwas*, and great grandmother of all (other) creatures! thou art the goddess (*Isáni*). (Ditto.)

14. Thou, *Sri Bhagavati Dévi Prájná*, art the sum of all the sciences, the mother of all the *Buddhas*, the enlightener of *Bodhi-jnyán*, the light of the universe! (*Gunakáranda Vyúha.*)

15. The humbler of the pride of *Namuchi-mára*, and of all proud ones: the giver of the quality of *Satya*; the possessor of all the sciences, the *Lakshmi*; the protector of all mortals, such is the *Dharma Ratna*. (Ditto.)

16. All that the *Buddhas* have said, as contained in the *Mahá Yána Sútra* and the rest of the *Sútras*, is also *Dharma Ratna*†. (Ditto.)

17. Because *Buddha* sits on the brow, the splendour thence derived to thy form illuminates all the ethereal expanse, and sheds over the three worlds the light of a million of suns, the four *Devatás*, *Brahma*, *Vishnu*, *Mahésa*, and *Indra*, are oppressed beneath thy feet, which is advanced in the *Alir-Asan*. O *Arya Tárá!* he who shall meditate on thee in this form shall be relieved from all future births. (*Saraká Dhará*‡.)

18. Thy manifestation, say some of the wise, is thus, from the roots of the hairs of thy body sprang *Akásh*, heaven, earth, and hades, together with their inhabitants, the greater *Devatás*, the lesser, the *Daityas*, the *Siddhás*, *Gandharbas*, and *Nágas*. So too (from thy hairs), wonderful to tell! were produced the various mansions of the *Buddhas*, together with the thousands of *Buddhas* who occupy them§. From thy own being were formed all moving and motionless things without exception. (Ditto.)

19. Salutation to *Prájná Dévi*, from whom, in the form of desire,

* *Sugatjá*, which the *Vámáchárs* render, 'of whom *Buddha* was born;' the *Dakshináchárs*, 'born of *Buddha*,' or goer to *Buddha*, as wife to husband.

† Hence the scriptures are worshipped as forms of *A'di Dharma Sútra*, means literally thread (of discourse), aphorism. *Sákya*, like other Indian sages, taught orally, and it is doubtful if he himself reduced his doctrines to a written code, though the great scriptures of the sect are now generally attributed to him. *Sútra* is now the title of the *books* of highest authority among the *Bauddhas*.

‡ Composed by *Sarvajna Mitrapada* of *Kashmír*, and in very high esteem, though not of scriptural authority.

§ These thousands of *Buddhas* of immortal mould are somewhat opposed to the so called simplicity of *Buddhism!!* whatever were the primitive doctrines of *Sákya*, it is certain that the system attributed to him, and now found in the written authorities of the sect, is the very antipodes of simplicity.

the production of the world was excellently obtained*, who is beautiful as the full moon, the mother of *A'di Buddha*, (*Jinindra Matra*,) and wife of (the other) *Buddha*, who is imperishable as *adamant*. (*Sádhana Mála*.)

20. That *Yoni*, from which the world was made manifest, is the *Trikonákár Yantra*. In the midst of the *Yantra* or *trikon* (triangle) is a *bindú* (point, cypher) : from that *bindú*, *A'di Prájná* revealed herself by her own will. From one side of the triangle *A'di Prájná* produced *Buddha*, and from another side, *Dharma*, and from the third side, *Sangha*. That *A'di Prájná* is the mother of that *Buddha* who issued from the first side ; and *Dharma*, who issued from the second side, is the wife of the *Buddha* of the first side, and the mother of the other *Buddhas*. (Comment on quotation 19.)

21. Salutation to *Prájná Páramitá*, the infinite, who, when all was void, was revealed by her own will, out of the letter U. *Prájná*, the *Sakti* of *Upáya*, the sustainer of all things, *(Dharmiki)* the mother of the world, *(Jagat-mátra ;)* the *Dhyánrúpa*, the mother of the *Buddhas*. The modesty of women is a form of her, and the prosperity of all earthly things. She is the wisdom of mortals, and the ease, and the joy, and the emancipation, and the knowledge. *Prájná* is present every where. (*Sádhana Mála*.)

A'di Sangha.

1. That *A'mitabha*, by virtue of his *Samta-jnyán*, created the *Bodhisatwa* named *Padma-páni*, and committed to his hands the *lotos*†. (*Gunakáranda Vyúha*.)

* *Dharmadya-sangata Kamrupini*, variously rendered, ' well got from the rise of virtue,' ' well got from the rise or origin of the world ;' also as in text, *Dharmadya*, the source of all things, signifies likewise the *Yoni*, of which the type is a triangle. See 20. The triangle is a familiar symbol in temples of the *Buddha Saktis*, and of the *Triad*. △ The point in the midst represents either *A'di Buddha* or *A'di Prajná*, according to the theistic or atheistic tendency of his opinions who uses it. Our commentator is of the *Vámáchár* or Atheistic school, and such also is his text.

† Type of creative power. *A'mitabha* is the 4th *Dhyani* or celestial *Buddha* : *Padma-páni* is his *Æon* and executive minister. *Padma-páni* is the *præsens Divus* and creator of the *existing* system of worlds. Hence his identification with the third member of the *Triad*. He is figured as a graceful youth, erect, and bearing in either hand a *lotos* and a jewel. The last circumstance explains the meaning of the celebrated *Shadakshari Mantra*, or six-lettered invocation of him, viz. *Om ! Mane padme hom !* of which so many corrupt versions and more corrupt interpretations have appeared from Chinese, Tibetan, Japanese, Mongolese, and other sources. The *mantra* in question is one of three, addressed to the several members of the *Triad*. But the *præsens Divus*, whether he be Augustus or *Padma-páni*, is every thing with the many. Hence the notoriety of *this*

2. From between his *(Padma-páni's)* shoulders sprang *Brahma;* from his forehead, *Mahá Déva;* from his two eyes, the sun and moon; from his mouth, the air; from his teeth, *Saraswatí;* from his belly, *Varuna;* from his knees, *Lakshmí;* from his feet, the earth; from his navel, water; from the roots of his hair, the *Indras* and other *Devatás.* (Ditto.)

3. For the sake of obtaining *Nirvritti,* I devote myself to the feet of *Sangha,* who, having assumed the three *Gunas,* created the three worlds. (*Pujá kand.*)

4. He (*Padma-páni*) is the possessor of *Satya Dharma,* the *Bodhisatwa,* the lord of the world, the *Mahá-satwa,* the master of all the *Dharmas.* (*Gunakáranda Vyúha*).

5. The lord of all worlds, (*Sarvalokádhípa,*) the *Sri-mán,* the *Dharma Rája,* the *Lokèswara,* sprang from *A'di Buddha** (*Jinatmuja.*) Such is he whom men know for the *Sangha Ratna.* (Ditto.)

6. From the union of the essences of *Upáya* and of *Prájná*† proceeded the world, which is *Sangha.*

mantra, whilst the others are hardly ever heard of, and have thus remained unknown to our travellers.

* From *A'mitabha Buddha* immediately: mediately from *A'di Buddha.*

† Such is the *Aiswarika* reading. The *Prájnikas* read 'from the union of *Prájna* and *Upáya.*'

With the former, *Upáya* is *A'di Buddha,* the efficient and plastic cause, or only the former; and *Prájná* is *A'di Dharma,* plastic cause, a biunity with *Buddha,* or only a product. With the latter, *Upáya* is the energy of *Prájna,* the universal material cause.

The *original* aphorism, as I believe, is, '*Prájnoupayatmakang jagata,*' which I thus translate: 'From the universal material principle, in a state of activity, proceeded the world.' This original *Sutra* has, however, undergone two transformations to suit it to the respective doctrines of the *Triadic Aiswarikas* and of the *Kármikas.* The version of the former is, *Upáyprájnamakang sangha;* that of the latter is, *Upáyprájnatmakang manasa.* Of both, the *Upáya* is identical with *A'di Buddha,* and the *Prájná* with *A'di Dharma.* But the result—the unsophisticated *jagat* of the *Prájnikas,* became *A'di Sangha,* a *creator,* with the *Aiswarikas;* and *Manasa,* the sentient principle in man, the first production, and *producer of all other things,* with the *Kármikas. Avidya,* or the condition of mundane things and existences, is an illusion, alike with the *Prájnikas* and with the *Kármikas.* But, whilst the former consider *Avidya* the universal affection of the *material* and *immediate cause* of all things whatever; the latter regard *Avidya* as an affection of *manas* merely, which they hold to be an *immaterial* principle and the *mediate* cause of all things else, *A'di Buddha* being their final cause. The phænomena of both are homogeneous and unreal: but the *Prájnikas* derive them, directly, from a material source—the *Kármikas,* indirectly, from an immaterial fount. Our sober European thoughts and languages can scarcely

P. S. With regard to the consistency or otherwise of the view of the subject taken in the sketch of *Buddhism*, with the general tenor of the foregone quotations, I would observe, that the ideal theory involved in the *Prájnika*, *Swabhávika*, and in the *Karmika* doctrines, was omitted by me in the sketch, from some then remaining hesitation as to its real drift, as well as its connexion with those schools, *and no other*. Upon this *exclusive* connexion I have still some doubt. For the rest, I retain unchanged the opinions expressed in the sketch, that the *Karmika* and *Yátnika* schools are more recent than the others—that they owe their origin to attempts to qualify the extravagant quietism of the primitive *Swabhávikas*, and even of the *Aiswarikas*—and that their contradistinguishing mark is the preference given by them respectively to morals, or to intellect, with a view to final beautitude. The assertion of the *Ashtasahasrika*, that *Swabháva*, or nature absolutely disposes of us, not less than the assertion of others, that an immaterial abstraction *so* disposes of us, very logically leads the author of the *Buddha Charitra* to deny the use of virtue or intellect. To oppose these ancient notions was, I conceive, the especial object of those who, by laying due stress on *Karma* and *Yatna*, gave rise to the *Kármika* and *Yátnika* schools. But that these latter entertained such just and adequate notions of God's providence, or man's free will, as we are familiar with, it is not necessary to suppose, and is altogether improbable. None such they *could* entertain if, as I believe, they adopted the more general principles of their predecessors. The ideal theory or denial of the reality of the versatile world, has, in some of its numerous phrases, a philosophical foundation; but its prevalence and popularity among the *Buddhists* are ascribable principally to that enthusiastic contempt of action for which these quietists are so remarkable. Their passionate love of abstractions is another prop of this theory.

cope with such extravagancies as these: but it would seem we must call the one doctrine material, the other, immaterial, idealism.

The phænomena of the *Prájnikas* are sheer energies of matter, those of the *Karmikas*, are sheer (human) perceptions. The notions of the former rest on general grounds—those of the latter, on particular ones, or (as it has been phrased) upon the putting the world into a man's self; the Greek "panton metron anthropos."

Erratum in No. 49, January, 1836.
Page 30, line 2 of note, *for* 'preferred,' *read* 'postponed.'
,, (et passim) *for* 'Sangata,' *read* 'Saugata.'

APPENDIX A.

Detailed Enumeration of some of the principal Attributes of A'DI BUDDHA, *referred to in the proceeding Quatations under that Head.*

द्वात्रिंशल्लक्षणानि।

चक्राङ्कितपाणिपादतलता १
सुप्रतिष्ठितपाणिपादतलता २
जालावद्धवज्रांगुलिपाणिपादतलता ३
मृदुतरुणहस्तपादतलता ४ सप्तोच्छ्रिता ५
दीर्घांगुलिता ६ आयतपार्ष्णिता ७ ऋजुगात्रता ८
उत्संगपादता ९ ऊर्द्धागरोमता १०
ऐनेयजंघता ११ पतुरवाऊता १२
कोषगतवस्तिगुह्यता १३ सुवर्णवर्णता १४
शुक्लछविता १५ प्रदक्षिणावर्त्तकरोमता १६
उर्णालंकृतमुखता १७ सिंहपूर्वार्द्धकायता १८
सुसंभृतस्कन्धता १९ चित्तांतरांगता २०
रसरसाग्रता २१ न्यग्रोधपरिमण्डलता २२
उष्णीषशिरस्कता २३ प्रभूतजिह्वता २४
प्रलम्बरता २५ सिंहहनुता २६ शुक्लदशनता २७
समदन्तता २८ हंसविक्रान्तगामिता २९
अविरलदन्तता ३० समचत्वारिंशद्दन्तता ३१
अभिनीलनेत्रता ३२

अशीति व्यंजनानि।

आताम्रनखता १ स्निग्धनखता २ तुंगनखता ३
वृत्तांगुलिता ४ अनुपूर्वांगुलिता ५ गूढशिरता ६
निर्ग्रन्थिशिरता ७ गूढगुल्फता ८ अविषमपादता ९
सिंहविक्रान्तगामिता १० नागविक्रान्तगामिता ११
हंसविक्रान्तगामिता १२ वृषभविक्रान्तगामिता १३
प्रदक्षिणगामिता १४ चारुगामिता १५
अवक्रगामिता १६ वृत्तगात्रता १७ मृष्टगात्रता १८
अनुपूर्वगात्रता १९ शुचिगात्रता २० मृदुगात्रता २१
विशुद्धगात्रता २२ परिपूर्णव्यंजनता २३
पृथुचारुमण्डलगात्रता २४ समक्रमता २५
विशुद्धनेत्रता २६ सुकुमारगात्रता २७
अदीनगात्रता २८ उत्साहगात्रता २९
गम्भीरकुक्षिता ३० प्रसन्नगात्रता ३१
सुविभक्तांगप्रत्यंगता ३२ तिमिरशुद्धालोकता ३३
वृत्तकुक्षिता ३४ मृष्टकुक्षिता ३५
अभयकुक्षिता ३६ अक्षोभकुक्षिता ३७

गम्भीरनाभिता ३८ प्रदक्षिणावर्त्तनाभिता ३९
समन्तप्राशादिकता ४० शुचिसमुदाचारता ४१
व्यपगतैलकालगाचता ४२
गन्धसदृशसुकुमारपाणिता ४३
स्निग्धपाणिलेखिता ४४ गम्भीरपाणिलेखिता ४५
आयतपाणिलेखिता ४६ नात्यायतवचनता ४७
बिम्बप्रतिबिम्बोष्ठता ४८ मृदुजिह्वता ४९
तनुजिह्वता ५० मेघगर्जितघोषता ५१
रक्तजिह्वता ५२ मधुरचारुमंजुस्वरता ५३
दृत्तदंष्ट्रता ५४ तीक्ष्णदंष्ट्रता ५५ शुक्लदंष्ट्रता ५६
समदंष्ट्रता ५७ अनुपूर्वदंष्ट्रता ५८ तुंगनासिकता ५९
शुचिनासिकता ६० विशालनेत्रता ६१
सितपक्ष्मता ६२ सीतासीतकमलदलनेत्रता ६३
आयतलकता ६४ शुक्लभ्रूकता ६५ सुस्निग्धभ्रूकता ६६
पीनायतभुजलतता ६७ समकर्णता ६८
अनुपहतकर्णेन्द्रियता ६९ अपरिस्फुटललाटता ७०
पृथुललाटता ७१ सुपरिपूर्णोत्तमांगता ७२
भ्रमरसदृशकेशता ७३ सितकेशता ७४
गुह्यकेशता ७५ असंगुणितकेशता ७६
अपुरुषकेशता ७७ सुरभिकेशता ७८
श्रीवत्समुक्तिकनंद्यावर्त्तुलसचिह्नितपाणिपादतलता ७९ ८०

पंच वर्णानि।

श्वेत १ नील २ पीत ३ रक्त ४ श्याम ५

दश पारमिता।

दान १ शील २ क्षान्ति ३ वीर्य ४ ध्यान ५
प्रज्ञा ६ उपाय ७ बल ८ प्रणिधि ९ ज्ञान १०

दश भुवनानि।

प्रमुदिता १ विमला २ प्रभाकरी ३ अर्चिष्मती ४
सुदुर्जया ५ अभिमुखी ६ दूरंगमा ७
साधुमती ८ समन्तप्रभा ९ धर्ममेघा

दश ज्ञानानि।

दुःखज्ञानं १ समुदयज्ञानं २ निरोधज्ञानं ३
मार्गज्ञानं ४ धर्मज्ञानं ५ अर्थज्ञानं ६ संवृत्तिज्ञानं ७
परचित्तज्ञानं ८ क्षयज्ञानं ९ अनुत्पादज्ञानं १०

दशाकाराः।

पृथिव्याकारः १ जलाकारः २ अग्न्याकारः ३
वाय्वाकारः ४ आकाशाकारः ५ आकाशनिरोधाकारः ६
वायुनिरोधाकारः ७ अग्निनिरोधाकारः ८
जलनिरोधाकारः ९ पृथिवीनिरोधाकारः १०

दशार्थाः।

प्राणार्थ १ अपानार्थ २ समानार्थ ३
उदानार्थ ४ व्यानार्थ ५ कूर्मार्थ ६ कृकरार्थे ७
नागार्थ ८ देवदत्तार्थ ९ धनंजयार्थ १०

दश बलानि।

स्थानास्थानज्ञानबलं १ कर्मविपाकज्ञानबलं २
नानाधातुज्ञानबलं ३ नानाभिमुक्तिज्ञानबलं ४
सतान्द्रियपरापरज्ञानबलं ५
सर्वत्रगामिप्रतिपत्तिज्ञानबलं ६
ध्यान विमोक्ष समाधि समापत्ति संक्लेश व्यावदान
स्थान ज्ञानबलं ७ पूर्वनिवासानुस्मृतिज्ञानबलं ८
च्युत्युत्पत्तिज्ञानबलं ९ आस्रवक्षयज्ञानबलं १०

दश वशिताः।

आयुर्वशिता १ चित्तवशिता २ परिष्कारवशिता ३
धर्मवशिता ४ अधिवशिता ५ जन्मवशिता ६
अधिमुक्तिवशिता ७ प्रणिधानवशिता ८
कर्मवशिता ९ ज्ञानवशिता १०

पंच कायाः।

धर्मकायः १ संभोगकायः २ निर्माणकायः ३
महासुखकायः ४ ज्ञानकायः ५

पंच चक्षुः।

मांसचक्षुः १ धर्मचक्षुः २ प्रज्ञानचक्षुः ३ दिव्यचक्षुः ४
बुद्धचक्षुः ५

इतिबुद्धलक्षणादिसमाप्ताः।

अथ अष्टादशशून्यता लिख्यते।

अध्यात्मशून्यता १ बहिर्धाशून्यता २
अध्यात्मबहिर्धाशून्यता ३ शून्यताशून्यता ४
महाशून्यता ५ परमार्थशून्यता ६ संस्कृतशून्यता ७
असंस्कृतशून्यता ८ अत्यन्तशून्यता ९
अनवराग्रशून्यता १० अनवकारशून्यता ११
प्रकृतिशून्यता १२ सर्वधर्मशून्यता १३
स्वलक्षणशून्यता १४ अनुपलंभशून्यता १५
अभावशून्यता १६ स्वभावशून्यता १७
अभावस्वभावशून्यता १८
मतांतरे विंशति शून्यताः लक्षणशून्यता १९
अलक्षणशून्यता २०

o

APPENDIX B.

Classified Enumeration of the principal Objects of Bauddha Worship.

Ekámnáya.

Upáya.
'Adi-Buddha.
Mahá-Vairochana.

Ekámnáyí.

Prajná.
Prajná-páramitá.

Dwayámnáya.

1. 2.
Upáya. Prajná. { Root of theistic doctrine.

1. 2.
Prajná. Upáya. { Root of atheistic ditto.

Trayámnáya.

2. 1. 3.
Dharma. Buddha. Sangha.

2. 1. 3.
Sangha. Buddha. Dharma.

1. 2. 3.
Buddha. Dharma. Sangha.

Pancha-Buddhámnáya.

4. 2. 1. 3. 5.
Amitábha. Akshobhya. Vairochana. Ratnasambhava. Amoghasiddha.

Pancha-Prajnámnáyí.

4. 2. 1. 3. 5.
Pándará. Lochaná. Vajradhátwísvarí. Mámakí. Tárá.

Pancha-Sanghámnáya.

4. 2. 1. 3. 5.
Padmapáni. Vajrapáni. Samantabhadra. Ratnapáni. Viswapáni.

Pancha-Sangha-Prajnámnáyí.

4. 2. 1. 3. 5.
Bhrikutí-tárá. Ugratárá. Sitatárá. Ratnatárá. Viswatárá.

Matántara-Pancha-Buddhámnáya.

1. 2. 3. 4. 5.
Vairochana. Akshobhya. Ratnasambhava. Amitábha. Amoghasiddha.

Matántara-Pancha-Prajnámnáyí.

1. 2. 3. 4. 5.
Vajradhátwísvarí. Lochaná. Mámakí. Pandará. Tárá.

Matántara-Pancha-Sanghámnáya.

1. 2. 3. 4. 5.
Samantabhadra. Vajrapáni. Ratnapáni. Padmapáni. Viswapáni.

Matántara-Pancha-Sangha-Prajnámnáyí.

1. 2. 3. 4. 5.
Sitatárá. Ugratárá. Ratnatárá. Bhrikutítárá. Visvatárá.

Matántara-Pancha-Buddhámnáya.

4. 2. 1. 3. 5.
Amitábha. Amoghasiddha. Vairochana. Ratnasambhava. Akshobhya.

Matántara-Pancha-Prajnámnáyí.

4. 2. 1. 3. 5.
Tárá. Mámakí. Vajradhátwísvarí. Pándará. Lochaná.

Shad-A'mnáya-Buddháh.

1. 2. 3. 4. 5. 6.
Vairochana. Akshobhya. Ratnasambhava. Amitábha. Amoghasiddha. Vajrasatwa.

Shat-Prajnámnáyi.

1. 2. 3. 4. 5. 6.
Vajradhátwísvari. Lochaná. Mámakí. Pándará. Tárá. Vajrasatwátmiká.

Shat-Sanghámnáya.

1. 2. 3. 4. 5. 6.
Samantabhadra. Vajrapáni. Ratnapáni. Padmapáni. Viswapáni. Ghantapáni.

Mánushiya-Sapta-Buddhámnáya.

1. 2. 3. 4. 5. 6. 7.
Vipasyí. Sikhí. Viswabhá. Kakútsanda. Kanakamuni. Kásyapa. Sákyasinha.

Matántara-Mánushiya-Sapta-Buddhámnáya.

6. 4. 2. 1. 3. 5. 7.
Kásyapa. Kakútsanda. Sikhí. Vipasyí. Viswabhú. Kanakamuni. Sákyasinha.

Prajná-Misrita-Dhyáni-Nava-Buddhámnáya.

2. 1. 3.
Akshobhya. Vairochana-Vajradhátwísvarí. Ratnasambhava.

8. 6. 4. 5. 7. 9.
Pándará. Lochaná. Amitábha. Amoghasiddha. Mámakí. Tárá.

Dhyáni-Nava-Buddhámnáya.

4. 2. 1. 3. 5.
Amitábha. Akshobhya. Vairochana. Ratnasambhava. Amoghasiddha.

8. 6. 7. 9.
Vajradharma. Vajrasatwa. Vajrarája. Vajrakarma.

Dhyáni-Nava-Prajnámnáyi.

4. 2. 1. 3. 5.
Pándará. Lochaná. Vajradhátwísvarí. Mámakí. Tárá.

8. 6. 7. 9.
Dharmavajriní. Vajrasatwátmiká. Ratnavajriní. Karmavajriní.

Dhyáni-Nava-Sanghámndyáh.

4. 2. 1. 3. 5.
Padmapáni. Vajrapáni. Samantabhadra. Ratnapáni. Viswapáni.

8. 6. 7. 9.
Dharmapáni. Ghantapáni. Manipáni. Karmapáni.

Misrita-Nava-Buddhámnáyánám ete Misrita-Nava-Sanghámnáyáh.

2. 1. 3.
Maitreya. Avalokiteswara. Gaganaganja.

6. 4. 5. 7.
Manjughosha. Samantabhadra. Vajrapáni. Sarva-nivarana-vishkambhí.

8. 9.
Kshitigarbha. Khagarbha.

Misrita-Nava-Buddhámnáyánam ete Nava-Dharmámnáyáh Paustakáh Buddha-Dharma-sangha-Mandale Púja nakrame étan Múlam.

2. 1. 3.
Gandavyúha. Prajná-páramitá. Dasabhúmíswara.

6. 4. 5. 7.
Saddharmapundaríka. Samádhirája. Lankávatára. Tathágataguhyaká.

8. 9.
Lalita-vistara. Suvarna-prabhá.

Nava-Bodhisatwa-Sangha-Prajnámnáyáh.

4. 2. 1. 3. 5.
Sitatárá. Maitráyani. Bhrikutítárá. Pushpatárá. Ekajatá.

8. 6. 7. 9.
Dípatárá. Vágíswarí. Dhúpatárá. Gandhatárá.

Nava-Devi-Prajnámnáyi.

2. 1. 3. 8. 4.
Vajravidáriní. Vasundhará. Ganapati-hridayá. Márichí. Ushnísha-vijayá.

5. 7. 8. 9.
Parnasavarí. Grahamátriká. Pratyangirá. Dhwajágrakeyúrí.

Misrita-Nava-Dharmámnáyáh.

4. 2. 1. 3. 5.
Pándará. Lochaná. Vajradhátwiswarí. Mámakí. Tárá.
8. 6. 7. 9.
Pratyangirá. Vajrasatwátmiká. Vasundhará. Guhyeswarí.

Mánushiya-Nava-Buddhámnáyáh.

4. 2. 1. 3. 5.
Sikhí Ratnagarbha. Dípankara. Vipasyí. Viswabhú.
8. 6. 7. 9.
Kásyapa. Kakutsanda. Kanakamuni. Sákyasinha.

Mánushiyá-Nava-Buddhámnáyáh.

1. 2. 3. 4. 5.
Dípankara. Ratnagarbha. Vipasyí. Sikhí. Viswabhú.
6. 7. 8. 9.
Kakutsanda. Kanakamuni. Kásyapa. Sákyasinha.

Mánushiya-Nava-Prajnámnáyí.

1. 2. 3. 4. 5.
Jwálávatí. Lakshanavatí. Vipasyantí. Sikhámáliní. Viswadharí.
6. 7. 8. 9.
Kakudvatí.. Kanthanamáliní. Mahídharí. Yasodharí.

Nava Bhikshu-Sanghámnáyáh.

1. 2. 3. 4. 5.
Pradipeswara. Ratnarája. Mahámati. Ratnadharí. A'kásaganja.
6. 7. 8. 9.
Sakalamangala. Kanakarája. Dharmodara. Ananda.

Iti Srí-Ekámnáyádi-Navámnáya-Devatáh Samápták.

N. B. The authority for these details is the Dharma Sangraha, or *catalogue raisonné* of the terminology of Bauddha system of philosophy and religion.

III.—*Notes explanatory of a Collection of Geological Specimens from the Country between Hyderabad and Nágpur.* By J. G. Malcolmson, *Assistant Surgeon, Madras Establishment.* *Pl. V.*

I had the pleasure of forwarding from Madras, a selection of geological specimens, collected in May, 1833, between the cities of Hyderabad and Nágpur. I regret, that circumstances prevented my doing this sooner, and that the notes in explanation of the localities whence they were obtained, must now be short and imperfect; I hope, however, that the specimens themselves will be of use in illustrating the geology of a tract of country hitherto undescribed, and which connects the formations of the south-east of the Deccan, with those in the neighbourhood of the valley of the Narbada.

From my inability to identify, describe, and figure the numerous fossils, discovered in the tract of country between the Godavery and the town of Hinganghát, 47 miles south of Nágpur, and the importance of these, in reference to the questions as to the relative age of the great trap formation of the Deccan, and of the west of India, and the clayslate formation of Voysey, with its associated sandstone*, and the periods of elevation of the granitic rocks, on which

* See his account of the diamond mines of Banganapilly.—As. Res. xviii.


78°
80°
82°
20°
Vindyah Mts
Narnulla
Gawulgur
Ellichapoor
Poornah R.r
Oomrawutty
Ackolah
Karinjah
Payne Gunga R.
Baussum
Lonar
Richwar
Mahoor
Tubrice
Poornah R.
Hingole
Ahoondah
Tulny
Oomerkeir
Doodnah R.
Wurdah R.r
Ramteak
Kamptee
NAGPOOR
Seetabuldee
Goomgaum
Takulghaut
Sindee
Mahandgaum
Hingonghaut
Naugree
Chiknee
Wurroonah
Banduck
Chandah
Wun or Wiroy
Pandercourah
Payne Gunga R.
Kair
Pindee
Sangaree
Rajoorah
Eeroor
Chicholy
Sirpoor
Mundwah
Wurdah R.
Idalabad
Echode
Bheemsury R.
Wirdah R.
1 Fossils
2 Granite & Mica slate
3 Sandstone
4 Granite
5 Basalt
6 Fossils in Lime on Granite
7 Fossil wood
8 Blue Lime stone
9 Fossil wood silicified. 1828
10 Clay Slate
11 Marine Fossils on Basalt in Lime. As. Jour.l Aug. 1835.
12 Iron Mines
13 Red Iron ore used here (See Ayin Akbery.)
14 a fine stream in May and formation of calcareous conglomerate
15 Lake Crater 6 Miles in circumference and 500 feet deep
* Basalt Hill.
* * * * Basaltic Hills probably connected with those near Beder & Medcondah. As. Jour.
16 Hot Springs



J B Tassin Lith Press Calcutta

they appear universally to rest; I am induced, contrary to my former intention, to take to England with me, those specimens of which there are no duplicates. The separation of the collection would greatly lessen its value, by depriving me of the opportunity of comparing, with each other, and with arranged collections, the fragments of those of which duplicates were not preserved, and of thus restoring the fossils of which no perfect specimen was found. A selection of the most perfect were, also, sent to Mr. Lyell, but as he considers it requisite that numerous species should be ascertained previous to arriving at any conclusion as to the age of the fossiliferous rocks, it may be for the advantage of Indian geology, to submit the rest of the specimens to him; and on the characters being determined, to return a portion of them to India. There are, however, a sufficient number of duplicates to illustrate the outlines of the geology of the interesting tract of country referred to, and to connect the singular phenomena observed, with others, to the west and east of the route, and in the countries of the peninsula to the south, and the Bengal provinces to the north. The outline map includes several places, inserted in the plans published along with Dr. Voysey's papers and Captain Jenkin's Account of the Mineralogy of Nágpur, p. 199, of the 18th volume of the Asiatic Researches; the interval between which, it will assist in filling up. I shall seldom use mineralogical terms, except I have had an opportunity of comparing the specimens with those collected by persons well acquainted with the science; and when they do occur, an examination of the specimens will afford the means of correcting any errors that may be fallen into. The geological relations of the strata were ascertained with as much care as the nature of the country permitted, and no exertion was spared in tracing them as far as possible, both on the plains, at the foot of the hills, and their most inaccessible summits. My avocations however were unfavourable, and a person more at leisure would find an ample field to reward his labours. He must, however, be prepared to pursue his examinations in the height of the hot season, when the grass and wood jungle are less luxuriant, and the plains free from their covering of *jawárí* and other grain.

Some account has already been published* of the country between Masulipatam and Hyderabad, on which I had not an opportunity of making many observations. One or two points, however, deserve to be noticed, as the specimens collected in this part of the route are similar to those found north of Hyderabad as far as Nírmal, and throw some light on appearances on which important inferences have been too hastily founded.

* Asiatic Researches, vol. xviii.

At page 70, volume ii. of the Gleanings in Science, a desire is expressed by a gentleman at home, stated to be of high scientific acquirements, that specimens should be collected from the face of the hill of Beirwarah, where it has been cut through by the *Kistnah* river; and the author of the queries seems to be impressed with a belief, that a lake had formerly existed some way above it, towards Warapilly. The distance, however, between the Warapilly ghat and Beirwarah, is considerable; and I do not think, that there are any decided appearances at the former of the blue limestone of the clay-slate formation* having constituted the margin of a lake. The strata at the upper part of the rising ground to the north of the river are as hard as those lower in the valley, or on the opposite bank. A specimen of this rock, of a pure white color, and of great hardness, which I broke from the summit of the ascent above Warapilly, well known to travellers from the difficulty of riding over the large smooth slabs of marble, and which would have been admirably adapted for lithographic purposes, had it been free from minute crystals of quartz, was sent to you about three years ago by Captain Smith of the Madras Engineers. The junction of this rock with the granite to the north, could not be seen, the country being flat, and covered with low jungle. Jaspers and fragments of trap are found in the bed of the river, and the granite to the north is intersected by numerous dykes of greenstone, usually running from S. E. by E. to N. W. by W. To the south of the river, the country is lower, and for some way beyond the town of Dachapilly, the limestone, usually dipping slightly to the south, continues to be the surface rock; which, whenever I have met with it, on the Kistnah, at Cuddapah, near Auk, and the diamond mines of Banganapilly, and at Tarputrí in Bellary, or in the neighbourhood of the Wurdah, affords the best indications of success to experiments in boring; copious springs spontaneously rising from it, or being lost in the interstices between its nearly horizontal strata.

At Beirwarah, the river Kistnah appears to have cut a channel through the short ridge of hills, which terminates on either side in rather precipitous cliffs, and admits the stream into the great alluvial plains extending to the mouths of the Kistnah and Godavery. Above, the country has much the appearance of having once been an extensive lake, the bottom of which now forms the rich plain extending to Condapilly to the N. W., and Munglegherry to the south of the river. It

* I use this term of Dr. Voysey, but think its adoption more objectionable than argillaceous limestone, used by Colonel Cullen in the Madras Transactions. It would be better to characterise it as "blue limestone," "Cuddapah limestone," or other term involving no opinion as to its geological relations.

is probably here, that Captain HERBERT's correspondent observed that the "hardness and composition of the rock appeared to differ, according to the pressure they have been subjected to." I believe, that, specimens of the rocks of the bottom of the hill, have been sent to the Asiatic Society by Dr. BENZA, and that they are composed of the peculiar gneiss of the coast. Felspar is common, and some of the varieties possess considerable beauty. There are the remains of a rock pagoda cut in a mass of compact felspar, above the road, leading along the edge of the precipice over the river, portions of which have fallen, the natural fissures of the rock exposing it to this kind of decay. On the top of the hill the soft friable white rock, No. 2*, is found, and is carried away by the natives for the purpose of whitening the walls of their houses. It corresponds exactly with specimens from Vizagapatam, described as gneiss by HEYNE, and containing imperfect garnets. It is not, however, either its site as lying above other rocks, or its exposed situation, that has led to its decay, so much as the composition of the ridge where the edges of the strata rise to the south. The strata dip at a very considerable angle a little to the south of east. A careful survey of the hills from the summit shows, that they are short insulated ranges, such as are found over the Circars and other tracts, rising from a level country; and that had a lake existed in the plain above, every slight rise of the river would have carried its waters round their shoulders to the north and south. The rise in the line of bearing of the strata of the hill north of the river, and the appearance of that to the south, do not support the opinion that the lake was drained by the river deepening its channel. I do not know whether it can be supposed to derive any support from a tale told of the river god (*Krishna*) having induced the patron of the hill, who seems to be a form of *Shiva*, to permit him to get his head through, and that then he forced a passage. The granitic hills of Condapilly are seen a few miles to the N. W.; and in the midst of the plain, rising out of it like an island, are some great masses of hornblende rock, No. 6; and Dr. BENZA informs me that he saw dykes of the same kind of greenstone passing through the gneiss at Beirwarah. A mile and a half further on the road to Hyderabad is a quarry of granitic rock, devoid of hornblende, and containing only a very little felspar and a few scattered garnets. A little beyond this, the rocks assume the decided characters of the great granite formation of the Deccan, with which Dr. VOYSEY's papers have made your readers acquainted. The geological structure of the Circars is in nothing so peculiar, as in the extensive

* The numbers refer to specimens deposited in the Society's Cabinet.—ED.

distribution of the singular sandstone-like gneiss described by Heyne; and which, in hand specimens, it is often impossible to distinguish from the sandstone also found in many localities: and I do not know a more interesting subject of inquiry, than that of ascertaining whether this singular rock is metamorphic, and the sandstone altered by the intrusion of the great masses of porphyry so commonly found near these equivocal rocks, and by the numerous greenstone dykes and masses scattered over the whole of these districts. The diamond mines of Mulavelly are at no great distance from Condapilly, to the right of the road, situated in a basin between hills covered with jungle. The sides of which, one-third from the top, were found by Dr. W. Davidson to be strewed with a sandstone conglomerate; but he was prevented getting to the top by the approach of night. Fragments of this are found in the gravel, of which I believe specimens have already been sent to the Society, intermixed with much kankar: and from some pits in the valley, most of the lime used in the district is procured. The soil of the country on the Hyderabad Military road, after leaving the alluvial plain above Beirwarah, is formed of decomposed granite, but contains much lime. This admixture, and the kankar nodules, are probably of recent origin; as I observed, in a valley to the right of the road north of the hill fort of Yeralagundah, about 18 miles from Beirwarah, a stream trickling over granite rocks, and depositing lime on all the branches and rocks around. Some pieces of stone of considerable size have thus been formed, and recent specimens, containing remains of branches, or of grass, easily crumble to pieces, and are carried away by the stream. The source of the spring I was prevented from ascertaining, by the approach of night; and as an excuse for leaving this and other interesting circumstances unexplored, I must state, that being in Medical charge of the European regiment, during a sickly season, I could not command my own time of marching, or sufficient leisure.

The character of the granite of the Deccan continues well marked throughout the remaining part of the route to Hyderabad, and dykes and imbedded masses of a fine crystalline greenstone or hornblende rock of great hardness are frequently seen. These last have occasionally irregular shapes, and in one or two instances, that of the italic or other irregular curve; and near Secunderabad, they appear to be connected with the dykes, in the neighbourhood of which they are found. It was also frequently observed, that the various substances entering into the composition of the granite in the neighbourhood of these dykes or masses, formed very large and distinct crystals; and the imbedded greenstone, though often intimately united with the

granite, was in others more loosely connected, and easily separated by the progress of decomposition, leaving rounded cavities in the rock.

A circumstance of more importance, however, is the occurrence of the beds of kankar in this tract, being, as far as I have observed, always near some of the greenstone dykes or beds, and frequently under or intermingled with masses of granite, which is in a rapid state of decay: these are usually rounded, partly from the progress of decomposition, and sometimes from the tendency to concentric forms, which it occasionally undoubtedly assumes. The small detritus is in some places accumulated to a great depth, and it has been stated by Dr. Christie, that this debris is, at a considerable depth, again consolidated by pressure. In the Edinburgh Journal of Science, 1828-29, this is also mentioned as a fact, common to the rocks of other parts of India. With every respect for his authority, I cannot avoid the conviction, that the inference was founded on imperfect observation, and that it has since been employed in Europe, in support of an ill-founded theory.

No. 15, is "Mhurrum" or gravel found in deepening a well at Bolaram, (six miles from Secunderabad,) upwards of 50 feet deep, during the very dry season of 1832, and is not in the slightest degree consolidated. A loose block, which had resisted decomposition, was found above it, and contains mica, (No. 15,) a rare ingredient in the granite of Hyderabad. Much of the debris at Secunderabad is, however, consolidated by lime, which is seen to agglutinate the fragments, or to pass in vein-like lines or nodules through the gravel. Occasionally there are only a few fragments of quartz or felspar scattered through the kankar, or they appear to be inserted into the surface, as in No. 10, which is extremely hard. Generally, however, the agglutinated gravel is friable, and the cement less obvious. The debris is also sometimes united into pulverulent masses, by the oxidation of the iron contained in the sienite; but this takes place at the surface, and seldom acquires any great degree of hardness. Specimens of the granite in the neighbourhood of Hyderabad are numbered 14; and the appearance of the surface of that polished by the continual passage of hyenas, in the entrance of the caverns formed in the pile of gneiss or granite of the "Chítá hill," near the cantonment, has been described in the 1st volume of the Journal of the Asiatic Society, (No. 12.) The greenstone occasionally has distinct crystals of felspar scattered through it, without the porphyry thus formed, losing the remarkable degree of toughness possessed by the black rock; but, as observed by Sir H. Davy, the decomposition of the felspar is more rapid than of the other parts, (No. 19.) The greenstone is familiarly

known by the name of "black granite," and forms, when finely polished, the beautiful tombstones of the Golconda mausoleums, and the pillars of that in which Hyder and Tippu Sultan are deposited, at Seringapatam. The remarkable quartz veins in the neighbourhood of Hyderabad have been described by Voysey and Christie; it is therefore only necessary to mention, that they occasionally exhibit a more or less regular crystallization, and at the same time, acquire the fine tints of the amethyst. It is seldom that they are sufficiently regular and perfect for the purposes of the lapidary; such specimens were, however, discovered a few years ago, close to the European barracks, and at a little distance from a great greenstone dyke, but not in direct contact with the quartz bed containing the crystals, which, on the contrary, passes into the ordinary sienitic granite of the country. The colour of the amethystine quartz seems to be derived from magnetic iron ore, which is disseminated in grains both through the milky quartz and the granite, amongst which they are found, and has not been noticed elsewhere in the neighbourhood. The amethystine quartz was again met with 60 miles north of Secunderabad, near Bekanúrpettah, in loose masses, along with that variety of laterite found near Beder, and described by Voysey, and which is seen along the coasts of Malabar and at Boranghur in the Southern Concan resting on basalt. The rising ground on which they were found is composed of granite; but the country around is of a black trap soil, and numerous low flat ranges of basaltic hills are seen to the north, the east, and the west. A vein of white quartz is also met with as at Secunderabad, but the specimens differ, in containing irregular shaped geodes of agate, lined with crystals, or a red opake mamillary quartz, approaching to calcedony. The iron in these is usually imperfectly mixed with the quartz, and from the appearances above described, and the quartz having in several specimens been changed into a red jasper, the surrounding trap may be supposed to have altered the rocks. The colouring matter seems to have been afforded by the laterite, which is found in the neighbourhood apparently in dykes, and in contact with the quartz which intersects the granite: but there being no section, and the water-worn surface only being visible, no evidence could here be obtained, in support of any of the opinions entertained by geologists, relative to this singular formation. The amethysts are also found south of Janganapilly, and at Kamareddypettah, and Mr. W. Geddes met with them, of a greenish yellow tinge, south of Balcondah.

Granite Tract between Hyderabad and the Nírmul Hills.

The valleys and some plains about Bekanúrpettah are composed of black soil, mixed with calcedonies, &c.; and to the west of the road

are some flat hills, which I had not an opportunity of examining. They corresponded in their steep sides and flat summits with the trap hills to be presently described, and Mr. Geddes informed me, that they are formed of amygdaloidal trap, based on decaying granite. With these interruptions, the granite continues to Kamareddypettah, but the mamillary eminences, and the tors and logging stones formed from their decomposition, are of more rare occurrence. The granite, however, still continues to exhibit the lamellar structure, and is easily split into large slabs. In some instances, where the lamellæ are thin, the vertical fissures which frequently intersect them in right lines, and greatly assist the progress of decomposition, cause the rock to break into regular rhomboids. The last "tor stones" observed on the road to Nágpur were north of Jakrampilly, where they occurred on a lofty hill, on which there is a small pagoda. After leaving the basaltic hills near Bekanúrpettah and Jungampilly, black soil is seen in the valley below a large tank, and some dykes of greenstone pass the road in the direction of S. by E. to N. by W. at Kamareddypettah: the granite is lamellar white, with black mica and some hornblende, and fragments of amethystine quartz are scattered about. A little to the north of the town, on ascending a very gentle ascent, the red soil and granite give way to black soil, derived from decomposed trap rock, which is concentric on the top, but lower down is arranged in imperfect strata. On descending the hill to the north, the black soil conceals the granite for a short distance; but at the bottom of the hill, and in the bed of a small water-course, it is seen of the same appearance as before. Immediately beyond this, there is a very remarkable hill, which is seen from a considerable distance standing out from the gently indulating country, and possessing the peculiar form of the trap hills of the Deccan. It lies five miles north of Kamareddypettah, and four miles south of the village of Nugger, and is marked on the specimens as the "hill of Nugger." On approaching it by a very gradual ascent, the soil changes to black; and all at once the hill rises with nearly perpendicular sides, constituting a narrow ridge, about half a mile in length, and of a shape approaching to that of an Italic *f* running nearly N. by E. to S. by W. The hill is entirely formed of basalt, as its form had led me to expect. Above and in the body of the hill it has a concentric globular structure, the external layers of which are remarkably soft, and on the top of the hill resemble a peperino; lower down it is soft, of a greenish color, and soapy feel, (Nos. 66 and 69.) The nuclei left undecayed on the top, are exceedingly hard and tough, of a deep black colour, and contain large crystals of olivine, and small globules of calcedony. Many small but very characteristic specimens

of this last mentioned mineral, which had been imbedded between the concentric nodules, were picked up (No. 67). At the bottom of the hill, the basalt loses its concentric form, and occurs in tables or laminæ, having the appearance of having been subjected to violent forces. It sounds under the hammer when struck. Various specimens of the trap are much loaded with iron, sometimes in grains of a reddish brown colour; at others, it appears as if it had been partially smelted, and is not very different in its appearance from some examples of laterite. Much of the "kankar" that abounds in the soil is coloured with iron, while other portions are perfectly white; it is not, however, confined to the soil, as it was observed to have formed between two laminæ of the basalt, and by the gradual deposition of the lime, to have nearly broken up the upper stratum. From between some of the vertical fissures in the tables, and round the large rounded masses that occur in them, a formation of "kankar" projects in several places half a foot from the surface of the rock. It was evident, that the water loaded with lime, percolating through the alluvial black soil, or through the rock itself, gradually deposits the earth, where its accumulation is favoured by circumstances, of which the most important is the occurrence of an impervious rock or soil below that supplying the lime; and this explains the absence of organic remains in this recent formation, except where, in soils rich in lime, it forms round the roots of plants, and unites with itself, here and there, a fresh-water shell. No. 47, is a specimen illustrative of these views, taken from the south bank of the Godavery. The rock over which the river flows is granite, intersected by some great dykes of greenstone, (No. 44,) whose surface has a smooth metallic coating where washed by the stream. They project eight or ten feet, and are divided into numerous rhomboidal masses by fissures, into which lime has been deposited; and in the bed of the river, numerous fragments of calcedonies, zeolites, and other minerals found in volcanic rocks, are partially cemented by lime. The banks are mostly composed of black cotton soil, and the lower part is covered with small irregular loose slabs, resembling the dried cow-dung used for fire; which are found in situ projecting from the bank, and connected above with portions formed round the roots of plants, and below with other layers spread out between different strata of the alluvial earth.

From the top of the hill of Nugger above spoken of, numerous insulated hills, and short ranges of a similar form, are seen to rise from the granitic tract to the east and west, but they do not observe any particular line of bearing, although the whole group seems to pass in a direction from east to west, like the other basalt ranges of the

table land. From this hill to four or five miles north of Nírmul (a large town nine miles north of the Godavery) as in almost all other parts of the peninsula, is intersected by numerous greenstone dykes, which generally run from N. by W. to S. by E. These dykes are of great importance to the agriculture of the country, as the granitic soil is extremely thin and poor, except in the valleys, where the clay formed by the decomposed felspar accumulates, and bears fine crops of rice, for which water is collected in tanks, often in a great measure formed of natural mounds of rounded or angular fragments of greenstone, which is little subject to decomposition. At Jakrampilly, there is a remarkable dyke of this kind, which can be traced for several miles by a series of tanks on one side of it : it is also remarkable in exhibiting, where it rises into a small hill near the village, the gradual transition of the granite into the greenstone, and in the latter, having a tendency to split into regular forms. When once a fissure, however small, is formed, the rain washes a gradually increasing portion of lime and other soluble parts of its surface into the interstices, until the masses are separated, in which the alterations of temperature probably assist. It is difficult to account for the manner in which the greenstone passes into granite in this instance ; but it is evident, that it has been raised by the granite above the continuation of the dyke at either end of the hill. I have been more minute in the description of the hill of Nugger, principally with the view of affording some information relative to the distinction of the basalt ridges, which have burst through the granite of the Deccan, from the greenstone dykes, which are of such frequent occurrence. The presence of olivine ; the soft wacke in which the globular basalt is embedded ; the less crystalline structure ; the passage into amygdaloid containing calcedonies, zeolites, &c. and the granite in the neighbourhood of all the *smaller* masses of basalt, differing little from that at a distance, may perhaps be sufficient to distinguish these important rocks from each other. The separation of the different ingredients of the granite into large crystals, and the insulated masses of greenstone found in it near the dykes, prove, that the rock had been softened by heat ; but judging from the appearance and great length of many of these dykes, I do not think that they were of contemporaneous formation with the rock through which they pass. Near one of these, at Secunderabad, a smooth, wall-like dyke of white granite passes through the sienite.

At Balcondah, 21 miles north of Jakrampilly, these dykes occur on the large scale, and the granite is much separated into its constituent parts, the felspar being of a fine red colour. Nine miles further north, in the bed of the Godavery, the felspar is of a still more beautiful red

colour; but good specimens could not be removed. Veins of quartz also occur at Balcondah, with turbid milky spots, as if altered by heat, and large imbedded crystals, (No. 42.)

* *Síchel Hills; locally known as the Nírmul range.*

Nírmul is surrounded by granite hills, containing much hornblende and a little schorl; and the summits of some of them appear to resemble the greenstone of Jakrampilly, but they were not examined. After passing some small ranges of hills, the ascent of the Nírmul chain commences five or six miles north of the town, and the road continues amongst lofty hills covered with forest, by a succession of ascents and descents, for 40 miles, when it descends by the Muklegandy ghat to the town of Eidlábád, nearly on the level of the flat country of Berár.

The southern ascent of Nírmul ghat, is the most deep and difficult, the hills not rising in a series of terraces as they do to the north; yet it is not easy to ascertain the precise direction of the part of the hill range over which this pass leads, on account of the projecting spurs and low hills at their base, the thick forest with which it is covered, and from its having something of a curved form. The general direction is from W. N. W. to E. S. E., which corresponds with that of the Síchíl range, to which these hills belong, and which extends from the great lake water of Lonar to the neighbourhood of Mungapett, where the silicious fossil wood (marked "fossil wood," Mungapett), was found in 1828. On approaching the hills, the granite is observed to become soft, and to decompose rapidly. In the bed of a stream it has a remarkable concentric appearance, which was also observed in the centre of the hills south of Thitnoor, where it is covered by trap, on which fossils were found. No schistose rock was found here, but 20 miles to the east of Nírmul, and a few miles south of the mountains, hornblende slate occurs on the granite, and along with it the magnetic iron ore described by Voysey in the Journal of the Asiatic Society, vol. II. It is not a sand, as might be inferred from his description; but the grains of iron are either mixed with the hornblende or occur in a sandstone-looking gneiss, from which the hornblende had disappeared. Specimens of the rock, which I saw dug up, and of the sand formed by pounding it on protruding masses of granite, are forwarded. The softer pieces were at once reduced to powder, while the harder were first roasted; and the one was then easily separated by washing in small shelving hollows dug in the clay. It is then melted, and its quality said to be improved by using teak branches: the iron is soft, but part is used in the mixture from which wootz steel is formed. The strata of the schists have been broken and elevated, but the

* Also called "Shesha."

dip and direction are in no two places the same. Here also, the granite was seen, in the bed of a torrent, in thin concentric scales, not unlike the extremities of petrified trees, caused by the unequal waste of the component parts, the quartz projecting unaltered.

On approaching the hills, the soil gradually became black, with scattered fragments of calcedony; and at the first part of the ascent, which is for some distance very gradual, a singular fragment (No. 49) of semi-vitrified matter was met with, containing small white crystals of felspar. It could not be distinguished from a piece of granite fused in a steel furnace, with which it was compared by Dr. Voysey. At the same place there were fragments so much like iron slag, that till I found them in a large mass resembling a dyke, I supposed that they were the product of a furnace, (No. 49.) The granite continues the surface rock a little further, passing into a black hard basalt, intermixed with many white spots, apparently of felspar; but I saw none of them rounded or distinctly crystallized, forming amygdaloid or greenstone porphyry, such as occur at the lower part of the pass leading to Eidlábad. On ascending the last part of the base of the hills, the surface was strewed with calcedonies, quartz, (No. 52) and other minerals of the same family, and amongst them, a few fragments of a softish white clayey and silicious stone, containing small shells of fresh water families. The trap then became softer, more vesicular with calcedonies, zoolites, &c. imbedded, and the surface covered with tabular crystals of the same kind as those so remarkable in the Poonah trap rocks; and latterly concentric, the external layers decomposing, and the nucleus lying in a soft greenish wacke. I spent several hours in ascending the highest points of the range, but was unable to discover any beds of fossil shells; large blocks of quartz were, however, observed, with a singularly angular surface, and sometimes with fine capillary crystals, much of which was found with the fossil fragments; and afterwards, in the same position and partaking of the characters of the fossiliferous masses found in sitû. These blocks were seen extending along the steep face of the hill at the same level as if they had been forced out of the mountain, or rather, as if the basalt, when erupted, had covered, and partially melted the bed on which it lay, and thus caused the singular appearance of those blocks. The highest summit east of the pass is caped by some horizontal strata, having some resemblance to sandstone that had been altered and blackened by heat; what its real nature was, I could not determine.

The hills, for 44 miles by the road, are arranged in terraces with steep sides and flat summits, rising now and then into conical elevations, with rounded or flat tops, and inclosing narrow valleys, abounding

in streams, or small table lands with water every where near the surface. On some of the ridges, the globular basalt becomes columnar, near which no trace of fossils, and hardly any calcedonies have been found. A thick wood and grass jungle, composed of very different plants from those most common on the granite hills, cover the whole tract, and render it unhealthy for the greater part of the year. In a deep valley, about the middle of the hills, where the Kurm or Kurrum river passes through them, the basalt is seen to rest on friable granite, (as near Nírmul to the south and Eidlábad to the north, and at one or two other places,) and a level plain of considerable extent and deep black colour extends to Etchoda to the neighbourhood of the shelly rock. The fossils were first found at Munoor, and between that village and Thitnoor, which is near the top of the Maklegandy ghaut. The most remarkable were found in the beautiful grey chert*, which either projects from the basalt in which it is imbedded, or rests in large blocks on the surface. The side on which they rest is remarkably smooth and even, while the others are rough and covered with bivalve shells of great size, and some of them having the epidermis still entire, resembling a recent bed of shells on the sea shore. A few univalves also occur converted into flint, and it is remarkable, that one small bivalve, thus altered, retains its colours. The masses are evidently in sitû, and have probably been consolidated by the basalt, with which they are surrounded, or on which they rest. Some specimens exhibit a mixture of sand and mud, merely slightly agglutinated and intermixed with fragments of shells; the greater part is converted into chert spotted with fragments, or containing the shells in a perfect state; in other places, the materials have arranged themselves into an enamel-like substance around irregular cavities containing fine crystals of purplish quartz, and in one specimen a formation of calcspar has taken place. Throughout the rock perfect bivalve shells, both closed or open, occur in the situation in which they had lived and been entombed. The most perfect are closed, and some of them are easily separated from the rock to which they are slightly united at a few points only; they are filled with the stone, mixed with fragments of minute shells, and some are entirely converted into chert, which retains the form even of the ligaments so completely as almost to lead one to expect to be able to open them.

Between Munoor and Thitnoor, masses of red chert project from amongst the basalt, and contain various shells, mostly univalves of small size, and some of them evidently belonging to fresh water genera. Near to these many fragments of different kinds were found

* See labels on specimens.

lying loose on the surface, and abounding in shells of various families. (See specimens.) Those in the green crystalline mass, resembling an ore of copper, were in many instances converted into quartz crystals, retaining the perfect form of the shells; one of these of exquisite beauty, which has been unfortunately broken, was found in the interior of a larger one: others were imbedded in a tough white clay rock, so soft as to soil the fingers. The greatest part consisted of a siliceous rock, partly converted into a black bituminous flint, or a coarse quartz, partially altered into calcedony, into which the majority of the shells were converted. Some, on the contrary, retained the structure of the shell unaltered, and effervesced with acids.

Amongst these, the fragments containing the fossil seeds of chara, associated with fresh-water shells, were found. The gyrgonites were not observed at the time the specimen was found, but the rock to which it belonged could not be far distant, as the shells are of the same species as in other specimens, having a similar mineralogical structure. In other fragments, remains of grasses appearing half consumed were seen; and in the large protruding mass of red chert, containing shells converted into calcedony, I discovered what I take to be the tooth of an herbivorous quadruped. A few of the shells I believe to be marine, and at the distance of half a mile, the principal masses of grey chert, containing the large marine shells, were found.

On descending towards Thitnoor, granite is seen at one place, and above, much quartz, having a slag-like surface of the kind seen above Nírmul occurs. A few specimens of black chert, with shells, were picked up in the bed of a nulla at Thitnoor, where it was also found in sitû. A loose piece of reddish and green flint, with shells, was also met with in a ravine three miles further north. Much lime and kankar was here mixed with the black soil, or was deposited in the water-courses; the greater part probably derived from the decomposed basalt, or from such layers of a soft white limestone, as were found between the laminæ of basalt, in digging pits to obtain water for the troops, when encamped at Etchoda. A compact stratified limestone, however, occurs in the vicinity.

The pass from Thitnoor, called the Muklegandy ghat, is formed of several terraces, of which three only are remarkable, and a steep descent between each. The surface rock of the second terrace is a rough, white limestone, which appeared to be consolidated in nodules, until it was broken, and found to consist of a great variety of shells, many of great size, but difficult to remove entire, forming a rock of a crystalline texture. The strata are horizontal, and in one place, where it is cut through by a torrent, the rock is 12 feet thick, and *is seen to*

rest directly on granite of a reddish color. The shells are of very various forms: several belong to the genus Ostrea of Linnæus; one very perfect Cardia was entire, both valves being connected, and one fragment, of a very large shell, has the water-worn appearance often seen on the sea-shore. The edges of the large shells are harder than the rest of the rock, and stand out from it, which has led the natives to compare its surface to the impression left by the feet of sheep, and to name it "Bakrí ke páun ká patthar." Over the surface, many fragments of basalt, calcedonies, &c. are scattered, derived from a lofty spur of the higher point of the mountain, which rises precipitously from the terrace within a few hundred feet of the fossil strata. A very remarkable mass of soft peperino, resembling ashes, of which a specimen is forwarded, seemed to proceed from the limestone, where it begins to be lost amongst the debris of the mountain; and amongst the loose fragments, were some very tough clayey stones, having the forms of small univalve shells adhering and embedded.

The facts above described, and the nature of the different fossil beds, more especially this great accumulation of marine shells *resting immediately on granite*, and the fossil seeds of charæ, now perhaps first found in India, leave no doubt on my mind, that this wild mountain country, now covered with a dense forest, had once been the bed of an inland sea or great estuary, on whose shore the charæ and associated fresh-water shells had flourished.

On descending the pass towards Eidlábád, the rock changes to amygdaloidal trap, with occasional masses of greenstone porphyry, having large crystals of felspar imbedded. The opake milk-white quartz, and the beautiful white porous crystalline mineral, which accompany the fossils, were found here, and were not met with elsewhere. At the foot of the pass, granite re-appears, and protrudes in great masses from the soil, for about four miles on either side of the town of Eidlábád*.

Basaltic Tract between Eidlábád and Nágpur.

The greater variety of rocks that occur between Eidlábád and Nágpur, and the interesting appearances they exhibit, will render it necessary to enter somewhat more into detail in describing the localities whence the specimens were collected; so as to afford the means of determining their relations to each other, and to the fossil deposits already described; as well as to the great western trap formation, and the stratified rocks to the north and south.

* The localities of some other minerals found in the Nírmul hills are marked on the specimens. The blood-red chert found in the valley of Ankní is remarkable.

The bed of the small river of Eidlábád (see map) is covered by numerous fragments of the argillaceous blue limestone, so well known as underlying the diamond breccia in the Cuddapah district south of the *Kistnah*. Three miles higher up, the stream runs over the slightly inclined strata of a fine white sandstone, having some quartz fragments imbedded, rising towards some lofty ranges of trap formation to the east, (the Manik-gurh hills*,) and are some places converted into a quartz-like mass, as is seen in some of the Cuddapah sandstones. It probably rests on the blue limestone, which is seen to pass into a soft bluish or reddish clayslate in the bank of a stream a few miles north.

About 10 miles N. of Eidlábád, the limestone is found on the surface, forming smooth slabs, having much calcareous spar and rock crystal between the strata, and in their veins through the rock, and in the course of the natural figures, numerous small round perforations are arranged in lines, and occasionally filled with soft calcareous matter. On a rising ground south of Zeynád, the marble had occasionally a dip of 40 degrees; but for the most part it was nearly horizontal, and the direction of the dip was quite irregular. In the nala of Zeynád, which runs over limestone, there is much tuff, having small pieces of the limestone imbedded, and evidently formed from the water of the stream (specimens No. 85); a similar formation is, however, found in a few places on the high level ground to the S. W. To the east of the village a gently rising ground extends nearly N. E. and S. W. for about three miles, and terminates in a small hill, which rises rather abruptly. The slope is formed of nearly horizontal slabs of marble, the edges of the strata being exposed by the gradual rise of the surface. In following the ridge to within half a mile of the little hill to which it rises, a singular appearance presented itself: a dyke of perfectly vertical stratification, about three feet in thickness, projects two feet from the general surface; its exterior is singularly irregular and altered, the constituents of the rock being formed into crystalline or flint-like minerals of lime, argil, or silex, while the internal structure retains the characters of the blue limestone. On following this natural wall for about half a mile, it is concealed by globular basalt, which has burst through the strata, and in forming the termination of the little ridge, has covered the surrounding limestone, of which a portion has been so singularly displaced. The basalt is vesicular, and resembles much of that found in the Nírmul hills. No fossils were found here; but in the ascent from the second terrace of the Muklegandy ghát, where the great bed of marine shells was incumbent on granite, the same limestone was seen

* The Manik-gurh hills run from N. by E. to S. by W. almost at right angles to the Nírmul range.

in sitû, greatly broken up by the eruption of the precipitous trap ridge, on which it was seen. The thickness of the grass and wood jungle prevented its being traced with sufficient accuracy. Fragments of the same rock were also seen at Thitnoor; and a very similar rock was observed in horizontal strata at Muneer, not far from some great blocks, containing marine fossils, in one specimen of which small univalve shells were found. But as this locality was only examined by torch light, I could form no judgment as to the formation being the same; although the total absence of fossils in the blue limestone, over extensive tracts in which I have searched for them, incline me to think that they are different.

The relative age of the blue limestone and great trap formation, to which these hills belong, being ascertained by these and other facts; it may be hoped, that a careful comparison of the fossils will assist in determining the period to which other rocks occurring to the north and south belong. I have not been able to detect amongst them any of the Himálaya fossils; but some fragments found in indurated clay at Jirpoh, near the hot springs in the valley of the Nerbada, and in a specimen from the Gawilgurh fossil rock, described by Dr. Voysey in the 18th vol. of the As. Res. appear to belong to some of the same shells.

The march to the Payngunga river is over a flat country of black soil, modified in some places by a mixture of earth derived from slate clay, which appears occasionally at the surface, and of the same kind as that found below the limestone of Cuddapah, or which takes its place under the diamond breccia of Banganapilly. Jaspers, striped red and white, are found in the black soil. Scattered over this extensive plain are a number of small conical hillocks of white kankar, apparently formed by springs issuing from the centre, and now dried up: in some of them the apex is a little depressed. Several long straight ranges are seen at a distance, generally flat on the summits, but occasionally rising into cones, with a lengthened base, corresponding to the direction of the hills. About half up the greatest height a remarkable line extends all along, on which the summits appear to rise as on a terrace, or like the parallel roads of Glen Roy.

The pebbles of the Payngunga are principally calcedonies of a reddish color and the blue limestone. No. 93 is a specimen of the calcareous sandy tuff from the banks of this fine river; it is found as high as 25 feet above the water at the fort; and is always horizontal, with black soil between the layers, which are from an inch to three feet thick. The surface is irregular, but seldom or ever shoots into branches like the tuffa of the Godavery, and holes occasionally occur in

the layers, from a deficiency of lime; in other places, it projects three or four feet, in consequence of the soft soil being washed away. In one of the specimens, numerous recent shells are imbedded, which correspond in situation to a layer of these left in the sand by the last fall of the river; and it is evident, that the tuffa is formed from the infiltration of the lime with which the black soil and the water of the river abound, into layers of sand. In all these rivers, and in the stream of Bibbery and others running into the Godavery above Badrachellam, beds of limestone conglomerate, cementing agates and calcedonies, are continually forming.

The country between the Payngunga and Kair *has at all seasons* many springs and streams of pure water; which give a lively and beautiful green to the vegetation, when the surrounding country is burned up by the scorching heats of May*. The first of these streams is at Lingtee, the water of which is loaded with lime, which it deposits on its bed in a thick incrustation of tuff. Loose pieces of branches, petrified by lime, were found on the banks, and a wall of kankar six feet high in contact with No. 95, seemed to have been formed from a spring which had gushed from a fissure in the blue limestone, which is here the surface rock, and rests on a reddish, very friable slate clay, as is seen in a section a mile further down the stream. The black flint, No. 96, resembling anthracite, was found higher up. This stream, which, in the driest weather, has sufficient water to drive a mill, is said to have its source about six miles distant in a low range of hills, over which the road passes more to the east, a little to the north of Urjuna, and three and a half miles from Lingtee. At this village, a small stream takes its rise in a hot spring, whose temperature, as it gushes from beneath the wall of a half ruined reservoir was, in December, 1833, almost 87°. Copious springs also rise in the bed of the little stream; and globules of gas are extricated from round holes in the mud; but on endeavouring to collect a quantity, it was found that there were considerable and irregular intervals between each jet of air, nor did it always issue from the same place. The springs rise through the blue limestone so often mentioned, which, in a section in the north bank, is seen to have been raised by some violent forces, in a very singular manner, so as to form a series of irregular piked gothic arches, overlaid by partially broken but horizontal strata. The spaces within the arches are filled with fragments of the same rock, all evidently forced from below. The bed of the stream has a covering of sand,

* The same was observed of the beautiful stream at Bibbery, in the month of May, 1828, and inclines me to think, that it derives its source in springs like those of Kair, to be presently described. It rises in the Nírmul range.

which, some way below, is agglutinated by lime into a tolerably hard rock. The sand is derived from a quartoze sandstone, which crops out in two or three places from the ascent south of the spring. The strata are not horizontal, but neither the dip nor line of bearing could be observed.

North of Urjuna the rock is concealed by the soil as far as the Pindee ghat, nearly a mile distant, which passes over the steep low range, in which the Lingtee nulla rises. Its top is rounded, but on either hand, several conical summits are seen outlying from the range, which extends for some way from N. W. to S. E. On leaving the plain of Urjuna, the blue limestone disappears, and the hill is found to be composed of the usual black concentric basalt, the nuclei of which are exceedingly hard, and contain much olivine: they are imbedded in a soft grey or greenish wacken. I was surprised to find the road and a ravine descending from the hill strewed with the limestone I had left below, and did not quite credit the guide, who pointed to the top of the hill as the locality from which they came. I, however, soon came to it in sitû, in its characteristic large smooth slabs, which render it so difficult to pass on horseback. They were observed to be slightly convex upwards, to be very much fissured in various directions, and if taken in the mass, to have a slight anticlinal dip, although on the top the slabs were horizontal and several places remarkably altered, as if they had been half fused; the argillaceous and siliceous matters having arranged themselves into beautiful streaks of a pale blue enamel, passing into calcedony, or crystallized in minute prisms. Some parts of these strata had acquired a deep black color, and a flinty hardness. On descending the hill on the opposite side, the same appearances presented themselves, and left no doubt of the limestone having been raised from its connections by the intrusion of the basalt, which had slightly bent the strata, and in doing so, had caused the numerous fissures, and the alteration of structure. North of the Pindee ghat, there are a number of very low rising grounds, flat on the top, and composed of black globular trap rocks: and on the valleys, many large coarse masses of calcedony are scattered; of which, on a slight examination, I saw none in the hills. Near this, the limestone, No. 97, was found in the bed of a nulla. A little further on, there are two very black conical hills of trap, and at their feet, great fragments of rock crystal, but of no beauty, and having cavities lined with calcedony. From hence to Kair, the country is more level, rising however a little, to the right of the road; and four miles from the Pindee ghat, and the same distance from Kair, I found the sandstone, Nos. 99 and 100. It was only seen in a small nulla where its strata appeared

to be horizontal, and was white, red, or of a fine yellow, easily decomposed, and having small metallic veins passing through its substance, No. 100, and in one or two places, passed into a breccia, cemented by lime. No other rock is found at a higher level. I had been induced to examine this extensive slope, as the occurrence of the blue limestone suggested the probability of a sandstone or breccia being found above it, as at Cuddapah, before I discovered the sandstone at Urjuna, and near Eidlábád; I was therefore much gratified by finding it, although different in mineralogical characters. The country did not afford any section, but the sandstone probably rests on the blue limestone, which is met with at a lower level, two miles to the north-east. A mile and a half south of Kair*, the road crosses a small river, where there are some masses of travertine several yards square, which have been carried down by the stream: they are entirely composed of petrified branches and leaves, with a cement in some parts of considerable thickness, and more or less crystalline, or resembling kankar.

The stream rises near the town in copious hot springs, whose water is considered to be exceedingly pure and delicious; but when taken from one of the springs, where it can be directly received, was found to be acid to the taste, and, on boiling, deposited lime, which the carbonic acid had held in solution. Bubbles of gas are also extricated with the water, from one of the springs. The lime separates in its course, giving a whitish appearance to the water of the pools, while it sparkles near the springs and in the rapids, as was the case also at Lingtí. The temperature of the spring, in 1831 and 1833, was 87° and is the same in May, June, and December; but the difference to the feelings, according to the temperature of the air, is so great, as to have led to the belief that it is cold in the day and hot at night; the thermometer, however, showed that it was the same at 3 P. M. and 5 A. M. of the 5th June, when that of the air was 100° and 81°. The principal spring rises at the root of a great Banian tree below the pagoda, and is stated by the devotees to flow in the same profusion the whole year, which they account for by saying that it flows from the Ganges at Benares. This and other springs form a stream, that increases as its course is followed downwards, notwithstanding that much is directed to gardens, and a fine sheet of paddy in the bend of the river thus formed. About half a mile below the spring, the first formation of rock is found crossing the stream like a dyke, but of considerable breadth; others more remarkable are found lower down, and after a winding course of $2\frac{1}{2}$ miles, it seems to cease. The congeries of branches, roots, and even

* This small town must not be confounded with a large place of the same name on the Godavery.

trees, sometimes hollow, and always in concentric rings of deposit, forms a beautiful sight when in masses of several tons weight. The strata were seen in one place to be 12 feet thick, and to rest on the common black alluvial soil ; near this, it had filled the original bed of the stream, and forced it to find another channel : and in two places, a fall of three or four feet, forming a pretty cascade, seemed to be occasioned by the growth of the rock, and the wearing away of the channel below. The deposit often conceals the remains of plants, with a smooth coating of considerable thickness and firmness, frequently rounded in irregular sections of large circles ; in others, in nodulous forms of great beauty, covering over the extremities of the smaller or larger branches, and occasionally preserving the wood in an hermetically-sealed cavity. The roots of the Banian now and then pass into the empty tubes, as if they were the mould on which they are formed ; others probably form on the weeds, which flourish in the wildest luxuriance along the banks : one of these I found to be 24 feet in height. Recent shells, such as now inhabit the stream, were found in many places enveloped in the stone. One fine specimen of *lymnæa* was attached to the side of the rock, as if it had been arrested there by the deposit of stone around it, and which has taken its shape ; its fine surface, where it adhered, being that of the fresh shell ; while the coating exhibited the color and fracture of the tuffa of the hillocks south of the Payngunga, and others exactly similar, near the town of Kair. Roots and branches were seen to lie in the deep water without a coating of stone ; but the series of observations so accurately described by Mr. Lyell was completed, by finding where the stream fell over some rocks, a plant still living, whose roots were thickly interwoven, and the leaves on a level, and just above the water, cemented into a mass of firm white tuffa. (Specimens of the water and tuffa were formerly sent.)

The spray seemed, therefore, to produce the deposit more quickly ; but specimens of moss growing below the water were also converted into sharp brittle spiculæ.

Below, some blocks were softened, and as if in part redissolved. Amongst the petrified plants, one tree $1\frac{1}{2}$ foot in diameter was seen : and also a few leaves ; but these were rare, I suppose from their rapid decay and smooth surface ; one of them seemed to belong to a species of lotus seen in a pool above, and another seemed to be the leaf of aloe. In some places the tuffa was sandy, and in one or two slightly tinged with iron ; some of it had a fine crystalline appearance, and considerable hardness ; while other specimens could not be distinguished from kankar. A tendency to the formation of a bluish white scum was observed on the surface of the still water, both here and at Lingtee : a slight

smell resembling sulphur was also occasionally perceived ; and at the latter, our people procured water of a very offensive taste, although perfectly clear, from a well which I did not see.

The water abounds with animal life, and the banks are covered with a profuse vegetation, amongst which many fine insects were seen ; and in the hot season, all forms of life seem to gather round this oasis in the black burned-up country around. The banks and water affording so much food, vast numbers of birds of different species, game, doves, kings-fishers, herons, &c. are collected together, whose habits a naturalist might spend months in observing, without exhausting the field of inquiry.

All the springs seemed to be equally loaded with calcareous matter, and similar formations by springs now closed up are seen on a rising ground down the river. Here too, the globular trap again appeared on the surface in several places, of small extent ; one was a little to the west of the greatest formation of travertine, and another below the ford where the hard nuclei were surrounded by layers of a grey friable wacke like that of the Nírmul hills, and are curiously divided into compartments by tuffaceous partitions. Near to this, the blue limestone is again found in extensive slabs, slightly raised from its horizontal position ; but as usual in no regular direction, the strata occasionally meeting each other at an obtuse angle. The same remark applies to the rock as seen to the north of the springs on the road to Won, and to almost every other place where I have met with it. Near the last mentioned bed of basalt, some irregularly inclined strata of blue rock, having a granular sandstone-like aspect, were seen, and at no great distance, large loose masses of vesicular scoriæ were found, (specimens Nos. 109, 115.)

But the most interesting appearances are seen, in a small irregular rising ground, above the pagoda at the principal spring, which will be best understood by an inspection of the specimens 104. The basis of the rock is a tough white limestone, projecting from the gentle rising ground in very irregular masses, passing into curious and beautiful jasperous minerals, often coated with minute rock and other crystals ; and the whole is perforated by large cavities, and even holes, evidently formed when the rock had been erupted in a semifluid state. Much tuffa is associated with these altered rocks, filling up many of the cavities, and having various minerals imbedded. I believe that few places exhibit so many of the most interesting effects of volcanic action, as the small district around Kair ; more especially in altering a stratified rock of apparently uniform structure, so as to form a great variety of mine-

rals*. A good deal of sandstone has been used in the old buildings, which the inhabitants stated to be brought from Sacra, five miles to the west.

To the north of Kair, the limestone resumes its blue color; the soil is black, and a little further on, mixed with calcedonies, &c. In the nulla at Won, quartz sand, sandstone, and a mineral resembling pudding-stone were picked up; and at the foot of the hill, the remarkable vegetable fossil figured in the fifth number of the Madras Journal, and now deposited in the museum of the Bengal Society. The small hill of Won is composed of sandstone of different colors, red, white, and yellow, and waved lines of a black color from disseminated iron, pass through it in various directions—the composition of which is the same as that in which the fossil is contained, and No. 100, from between Urjuna and Kair. The strata have been elevated by the convulsions to which the rest of the district has been subjected, and have a dip from the apex of the hill, varying from 35 to 55 degrees: their direction on the southern face of the hill, is nearly from E. to W., but to the west they turn off towards the rising ground on which the town is situated, the line of bearing of the strata being from S. E. to N. W. The swell of the hill extends some way to the east, but the country is on the whole level. This sandstone is also found to the eastward in the basin of the Wurdah and Godavery, beyond Chanda.

Sand derived from these rocks forms the soil for two miles north of Won: between that and the Wurdah, it consists of the basaltic black soil, and the gravel of that river is composed of calcedonies, agates, &c. of which a calcareous conglomerate, in horizontal strata, two or three feet thick, has been formed, No. 123.

At Waronah, white sandstone and a yellow slate, apparently belonging to the clay slate formation to which Voysey refers the blue limestone, is used in building; and one obtained from a hill five miles distant, which I had not time to visit. Most of the pagodas between Hingan ghat and Chanda are built of the same materials. Between Waronah and Chiknee the country is level, well cultivated, and the water within a few feet of the surface; much fever prevails after the rains, although there is no wood or marsh. Basalt protrudes from the level soil, and near it, the bed of a small nulla displays strangely altered strata of the red slate clay, seen at Lingtee, which is broken up, and intermixed with crystalline nodules and layers of calcareous

* In some specimens, the surface has the appearance of a semifused brick, which had assumed something of a regular arrangement, whilst the centre is composed of the blue limestone little altered.

spar, having a red clay in the interstices. The specimen (No. R. 5) gives an imperfect idea of the singular appearance of this rock. At Dyeghám, two miles further north, and about the same distance south from Chiknee, it is seen dipping to the west of south at a considerable angle, is much fissured, and is reticulated with beautiful veins of calcareous spar, filling up the vertical interstices, which vary from a line to half an inch in breadth ; they intersect each other in all directions without disturbance, and were evidently formed at one time.

To the east of this, and of the village of Chiknee, there is a very gentle rise of the country, and concentric basalt and great round trap boulders are seen wherever the soil has been removed. On this are found numerous great blocks of indurated clay, of remarkable hardness, and exhibiting all the varieties of that mineral, of flinty slate, of compact schist, and of semi-opal*. Many of these masses are also found imbedded in the basalt ; and on a very careful examination, the inference could not be avoided, that they owed their different appearances to the greater or less heat to which they had been exposed. Most of them are full of large and small univalve shells, many of which are of fresh-water genera. Many of the shells are changed into opal, others are covered, or their shape taken and preserved by quartz crystals ; while the shells of a few can be separated unaltered, and effervesce with aids. The spines of the small shells are often insulated in cavities in the rock, and their crystalline surface is often very beautiful, when examined with the microscope. Some vertebræ and the head of a fish were met with ; but from the great toughness of the rock, part only could be broken off, and a portion of the same block was converted into a red flint, with shells changed into opal. A large loose block of a slaty structure was found near this, containing fragments of very large bivalve shells of great thickness, along with wood converted into a black flint, intersected by fine veins of a light purple opal ; and other bivalves which had been crushed together, were found in a flinty state on the upper part of the rising ground. I do not think that I go beyond the limits of correct inference, in supposing these shells to have lived in a mud formed from the decomposition of the clay-slate found in the neighbourhood, and through which the trap is seen to have burst†.

* Loose specimens of this rock was seen by Mr. W. Geddes, Surgeon of the Madras European Regiment, in 1829, who directed my attention to ascertain their position.

† Shells were first found here by Mr. W. Geddes, late of the Madras Medical Establishment.

The country to Naugri continues to be composed of basalt, which is in some places tabular, with green earth between the laminæ; and the soil is covered with calcedonies, ribbon and pudding stone, jaspers, resembling those found in the Nírmul hills, to which the whole character of the formation remarkably assimilates, and leaves no doubt of their belonging to one great period of protrusive violence.

At Naugri, fossils like those of Chiknee are formed; and with the conical masses of calcedony, having a smooth flat base of cachelong, the centre being filled with quartz crystals and calc spar; which were afterwards seen in sitû at Hingan ghat, inserted between the globular basalt with the apex downwards, the peculiar appearance of the base being perhaps caused by slow cooling.

At Hingan ghat, a number of blocks, loose, of a black and red chert, containing silicified branches of dicotolydonous trees, and a very perfect portion of a palm (date?) tree were discovered: and the same kind of rock, but without fossils, protruded from the basalt a little below Colonel Lambton's tomb. The basalt was globular, but seems to have had a tendency to form five or six-sided prisms. The rest of the route to Nágpoor is over a level country, from which a few insulated trap hills rise abruptly, on whose summits basaltic columns are occasionally met with. On the south side of the small range of hills near the city, these columns are very regular, and inclined to the south, at an angle of 45°, in consequence of which many of them have fallen. The flat top of the hill forms a pavement of the ends of similar columns perpendicular to the horizon. The round flat topped hill of Sitabuldee, which is accurately described by Voysey in the 18th volume of the As. Rs. is separated a few hundred yards from the extremity of this range, and rests on a decomposing granitic rock; its great and irregular masses show a similar tendency to crystalline arrangement, and thin sheets of calcedony are found in the joints.

To connect these observations with those published in the As. Researches and Journal, on the countries south of the Nerbada, it is necessary to mention, that at the cantonment of Kampty, eight miles north of Nágpoor, the sandstone is met with in the north bank of the Kanan river; and a mile higher up, the granite has been forced through the strata, bending or converting them into quartz rock. The crystals of felspar and plates of mica are remarkably large, and mica slate is seen in a quarry a few hundred yards distant. Beyond this are some small hills of upraised gneiss; near to which a conical hill of curiously altered rock, resembling that above the hot springs of Kair, has burst through a limestone, which it appears to have converted into a fine crystalline bed, like that found in the primitive districts of Scotland.

From the summit of this volcanic rock the basaltic hill of Sitabuldee and others are seen to the south and west; and at the same distance to the north, the rounded mica slate and granitic hills of Ramtesk, which extend into the Bengal territory south of Ságur.

An examination of the map will impress more strongly, than any thing I can urge, the importance of examining the whole Sichel or Shesha range, from the great lake water of Lonar, (to which the attention of your readers was called in the number of Journal for June, 1834,) to the fossil beds of the Nírmul hills; and from thence to Bibbery, the fossiliferous localities above Mungapett, and the hot springs of Byorah and Badrachellam. Other hot springs are also said to be found in the Nírmul range, regarding which I could get no correct information.

There are three other points to which it may be well to call the attention of such of your readers as may have an opportunity of visiting these localities.

1*st.* Whether the Sichel hills really terminate about Mungapett, or are continued in broken ranges towards Rajamundry? I have long considered it probable that the dykes so common in the Circars are connected with the great basaltic ranges which cross the Deccan in nearly the same direction; and Dr. Benza has recently discovered a bed of marine fossils on the top of a basaltic hill five miles south of Rajamundry, and a little above the alluvial plains of the mouths of the Godavery.

2*nd.* Whether the basaltic hills near the Manjerah river, on which Dr. Voysey discovered fossils, are connected with those of Bekanurpettah and Nugger above described; and whether they belong to the same geological period as the Nírmul hills?

3*rd.* I entertain little doubt that the basaltic formation of the valley of Berar and the basin of the Panah river, which falls into the Tapti, belongs to the period of eruption which elevated the Nírmul fossils from the bed of the sea; before, however, coming to this conclusion, with reference to the northern part of the valley, the connection between the localities of the Nírmul and Chiknee fossils with those of the Gawilgurh hills (A. R. vol. 17th) must be ascertained.

4*th.* The exact relations of the crater of Lonar to the great volcanic district to the N. W. where fossils have not yet been met with.

But as the difficulties opposed to the investigation of the greater part of such wild and unhealthy tracts will probably prevent these desiderata being soon supplied; I hope that a sufficient number of organic remains have been obtained from the central point of the district, to enable an experienced geologist to arrive at a tolerably correct esti-

mate of the relative age of part of the great trap formation of the N. W. of India, which the President of the Geological Society in the anniversary address to that body in 1833, stated to be quite unknown: "no vestiges of secondary or tertiary formations having been detected within the region described."

IV.—*Description of a New Species of Columba.* *By* B. H. Hodgson, *Esq. Resident in Nèpál.*

The following description of a new species was originally sent to the Society six years ago, but it does not appear to have been published. It has since been described as new by the Zoological Society in 1832. With the description went a drawing, coloured, and large as nature. Owing to the tardy appearance of the Society's quarto volume, the papers that did appear there had been forestalled: thus red-billed Erolia, but also my Circæetus Nipalensis, take precedence, by *two years*, of Gould's *Ibidorhyncha Struthersii* and his *Hæmatornis Undulatus*, which are the same species under new names. Both birds are types of new genera: see the Journal of the Zoological Society under date Dec. 27th, 1831, quoted, pp. 170 and 174. I described them *both* two years and some months previously: as the dates of the papers and the proceedings of your Society can prove*.

Order Rasores. *Family*, Columbidæ. Genus *Columba*. Species new.

Columba Nipalensis, (mihi.)

This elegant species is found in the woods of the valley of Nèpál. It is seen exclusively in the wild state, and is very shy, seldom or never entering the cultivated fields for the purpose of feeding, but adhering almost always to the woods, and living upon their produce, in the shape of grass, seeds, and berries.

Except in the breeding season, it is very gregarious, and it breeds, I am told, only once a year, laying its eggs in June and July. I cannot bring it exactly under any of the *ABCDarian*† allotments of the numer-

* We can offer no further explanation of the loss of the author's MS. than was before given (J. A. S. IV.) neither can we find the plate to which he alludes. But we take this opportunity of circulating a lithograph of the Erolia and bearded Vulture described in vol. IV., which may serve as a peace offering to the justly offended author.—Ed.

† A. orbits and tarsi plumose.
B. orbits plumose, tarsi naked, tail even.
C. orbits plumose, tarsi naked, tail wedged.
D. orbits naked.
a. feathers of the neck and quills simple.
b. feathers of the neck notched at tips.
c. quills bifid at tips.

ous species of this genus, according to the specification of those allotments in the 14th vol. of Shaw's Zoology, as will be perceived by the following enumeration of characteristic particulars.

There is a naked space round the eyes. Two-thirds of the tarsi are plumose, the remaining third only being naked, and the toes also are naked. The quills are simple at their tips. The feathers of the neck are sub-elongated and acuminated at their tips. The tail is even.

In an earlier vol. of Shaw, the Abcdarian division of the species is not carried so far as in the vol. just mentioned: and the following disposition of species, to be found in vol. xi. p. 2, of that work, has at least nothing inconsistent with the enumeration of significant particulars above given in reference to our bird.

A. tail equal.

a. orbits naked, feathers of the neck elongated, and acuminated at their tips.

Comparing, for the sake of further illustration, our bird with the *Columba Livia*, or common pigeon, it differs in being larger; in having the soft membrane at the base of the bill less tumid and mealy; in having a somewhat longer tail, and shorter, and more lowly feathered tarsi, not to mention the naked space round its eyes, and other diagnostic particulars, which have been separately explained.

The wings are about the same length as in the common species; but owing to the tail being longer than in that species, they have the appearance of being shorter, and they do not reach within two inches of the extremity of the tail.

What further illustration of this species may be needed will be best gathered from a perusal of the details of size and proportions given below, and contrasted with those of the common pigeon. I now proceed to the plumage, in respect to which our bird bears a strong resemblance to the Parabolic pigeon. The principal colour is a dark slaty blue, deepened into more or less perfect black in the quills and tail feathers; and shewing clearest on the lower part of the back, on the lesser tail and wing coverts above, on the thighs, and on the whole of the tail and wing coverts below. Upon the lower part of the hind neck, the upper part of the back, the lesser wing coverts above, and the most part of the body below, the principal colour is almost superseded by a rich purplish tinge; and all the feathers so tinged, save those of the upper back and of the sides of the body, are further adorned by being broadly margined or pointed with pale clear bluish grey. The head and top of the neck are wholly of the softest bluish grey, which colour, as it descends the body, forming in its descent the margins and points just noted, gradually decreases in quantity, and fades in hue. It pre-

vails rather on the lower than upper surface of the neck, and in respect to the body, is no where seen above, except in the shape of some roundish dots of nearly pure white on the lesser wing coverts.

The bill is black, shewing faintly a purplish tinge, which is more clearly visible in the basal membrane of the bill, and on the naked orbits. In front, the legs and feet are black green; elsewhere, they are yellowish. The claws are clear, lively yellow. The iris of the eyes hoary grey or white.

The female is as large almost as the male, from which she differs only in having the bluish grey of the head less clear and pale, and in wanting almost entirely the purplish tinge, which adds so much beauty to certain parts of the plumage of the male, especially the upper part of his back, and the lower part of his belly. This species is, I fancy, questionless new; and as it seems to be peculiar to these mountains, if not to Nèpál proper, *Columba Nipalensis* would be a very appropriate name for it.

Dimensions and weight of the *Columba Livia* and *Columba Nipalensis*.

	C. L.		*C. N.*	
	feet.	*inches.*	*feet.*	*inches.*
Tip of bill to tip of tail,	1	1	1	2¾
Length of bill (to the gape),	0	0 9/16	0	1
Ditto of tail,	0	5	0	6
Ditto of a wing,	0	8¾	0	9
Expanse of wings,	2	0	2	1½
Length of tarsi,	0	1¾	0	1 1/16
Ditto of central toe and nail,	0	1⅝	0	1½
Weight,	11¾ oz.		12½ oz.	

Valley of Nèpál, Dec. 1829.

V.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 2nd March, 1836.

W. H. Macnaghten, Esq. V. P. in the chair.

Lieut.-Col. J. Colvin, Engineers, Lieut. Col. L. R. Stacy, John Neave, Esq. C. S., Lieut. A. Cunningham, Engineers, and Rája Vijaya Govinda Singha Behadur, proposed at the last meeting, were ballotted for, and duly elected members of the Society.

Read a letter from Mr. Alexander Beattie, withdrawing from the Society.

Read a letter from W. H. Macnaghten, Esq. Secretary to the Government of India, Political Department, acknowledging the receipt of a copy of the communication from His Excellency Prince Esterhazy.

Read the following reply from Government to the Secretary's letter, written in pursuance of the resolution of the last meeting, in regard to

the oriental manuscripts and printed volumes of the Fort William College Library*.

To James Prinsep, Esq.

Genl. Dept. *Secretary to the Asiatic Society.*

Sir,

I am directed to acknowledge the receipt of your letter, dated the 6th instant, and in reply to state, that the Governor of Bengal accepts the offer of the Asiatic Society to provide rooms for the accommodation of, and to hold accessible to the public, the Oriental portion of the late Library of the College of Fort William, and has ordered the books to be made over on the following conditions: The books are to be the property of the Government until the Honorable Court of Directors shall decide whether they shall be made over absolutely or not, the Society to be ruled of course by their decision. The Government to allow the Asiatic Society a monthly sum of 78 Rupees, (stated by the Secretary of the College to be the minimum expence for custody of the books,) in consideration of the Society's providing for establishment and keeping the books clean and in proper repair. All other charges to be provided by the Society. The above allowance to cease, in case of the property in the books being made over to the Society.

Fort William, the 24th Feb. 1836. H. T. PRINSEP, *Secy. to Govt.*

Resolved, that the Society acquiesce in the terms proposed by the Government, and that the Secretary do take measures for receiving the books and granting receipts for them to the Secretary of the College Council in the course of their daily transfer.

Library.

The following books were presented:

Memoirs of the Astronomical Society, vol. 8th—*by the Society.*

Transactions of the Agricultural and Horticultural Society of Calcutta, vol. 2nd—*by the Society.*

The following by Professor Bopp:

Grammatica Critica Linguae Sanscritae, two editions, 1829, 1832—*by Professor Bopp.*

Glossarium Sanscritum, 1830—by ditto.

Nalus, Maha-bharati Episodium, 1830—by ditto.

Diluvium, cum tribus aliis Maha-bharati praestantissimis Episodiis, 1829—by ditto.

Uber einige Demonstrativstämme und ihren Zusammenhang mit verschiedenen Propositionen und Conjunctionen im Sanskrit und den mit ihm verwandten Sprachen, 1830.

Uber den Einfluss der Pronomina auf die wortbildung im Sanskrit und den mit ihm verwandten Sprachen, 1832—by ditto.

Ardschuna's Reise zu Indra's Himmel, nebst anderen Episoden des Mahabharati—by ditto.

Conjugations System, 1 vol. 12mo. 1816—by ditto.

Die Sundflut, 1 vol. 12mo. 1829—by ditto.

Geological Report of an examination, made in 1834, of the elevated country between the Missouri and Red Rivers, by G. W. Featherstonhaugh, U. S. Geologist, presented by the American Philosophical Society.

The following books were received from the book-sellers:

Bridgewater Treatises, Prout's Chemistry, 1 vol. Kirby on Animals, 2 vols. Roget's Physiology, 2 vols.

Lardner's Cabinet Cyclopedia, England, vol. 5th.

———————————, Greeks and Romans, vol. 2nd.

* The resolution, by inadvertence, was omitted in the printed proceedings. It was to the effect, that as Government had been pleased to transfer the European portion of the College Books to the New Public Library, the Society begged to tender accommodation in its rooms for the Oriental portion of the same, the Government agreeing to pay the establishment necessary for its due preservation while in deposit.

Illustrations of the Botany, &c. of the Himálayan Mountains, and of the Flora of Kashmír, by J. F. Royle, Esq.

Museum of Antiquities, &c.

Facsimiles of inscriptions on two slabs of stone at the entrance of a very ancient Temple, supposed to be Buddhist, on the Hill Fort of Gualior, taken by Mrs. Sale, were forwarded by Major Sutherland, Resident at Gualior.

Extract of a letter from Colonel H. Burney, dated Ava 15th January, announced the transmission viâ Rangoon, of a small box containing some Buddhist images found by Captain Hannay at Tagoung, 100 miles above Ava on the Irawadi.

"Captain Hannay's last letter is dated from Tsen-bo, (the Sembooa of the Map of the Burmese Empire compiled in the Surveyor General's Office in 1825,) three stages above *Baman*. He must have reached Mogoung on the 5th instant. He speaks in the highest terms of the general appearance of the country, and estimates the population, particularly on the right bank of the Irawadi, to be much more numerous than I had imagined. At Baman he was much interested by the Chinese, who were inquisitive but civil; and he estimates the breadth of the Iráwadi at Baman, to be *full two miles* during the rainy season! The *Sherelee* and other rivers falling into it are too inconsiderable to have any connexion with M. Klaproth's Tsan-po.

"I am writing to you in great haste. The cold at Ava this year is unusually great; the thermometer at this moment has fallen to 45°, and I am sitting in an open verandah without a fire, and shivering under a piercing northerly air, which seems to be coming directly from the snowy mountains."

Extract of a letter from W. Ewer, Esq. was read on the subject of the interlined writing on the Lath at Allahabad, which he reported to be in too imperfect a state to be copied or decyphered.

Mr. Ewer reminded the Secretary that he had communicated a drawing of the trident at Barahaut and the inscriptions on it 10 years ago.

A letter from Col. Stacy was received, on the point in dispute of the relative antiquity of the striking of coin in India.

A tabular view of the statistics of Muttra was presented by Captain R. Wroughton, who promised to furnish similar tables of all divisions of the country measured by himself as a part of the grand revenue survey.

An accurate meteorological register, kept in Nipál by Capt. Robinson, for 1835 was received from the Resident at Katmandhu.

A register of the thermometer for the same year, from Mr. Edgeworth at Amballa.

The following models from Nipál were preseuted by Dr. A. Campbell.

1. Sugar-cane mill, or press, called *Tusa* by the Newars, and *Rulu* by the Parbattiahs.
2. Oil press, called *Chikon-sa*.
3. Water-mill, called *Pan-Chaki* of the northern Doab, and western hills, and *Kau* by the Newars.
4. Spade, called *Koo* by the Newars, *Kodali* by the Parbattiahs.
5. Crutch, called *Kurmughan* by the Newars, used for breaking the clods and pressing the soil.
6. *Roochi-mughan*, used by the Newars to cover sown wheat, and *Gayha*, or upland rice.
7. *Chassu-mughan*, used to smooth the flooded beds, in which the seeds of the *Malsi* and *Toki* is sown, and also prepare the soil for sowing vegetables, pepper (red), ginger, &c.
8. *Roo Retcha*, used for weeding the flooded rice.
9. *Chong Kooki*, used in weeding the *Gayha*, or dry land rice, *coud* (a vetch) or other drill crops.
10. *Rooè*, used for spreading grain to the sun, and collecting it in heaps after its removal from the straw.

11. *Ooghan-Okua*, used for husking grain.
12. *Rooti*, used for making *Chaul* (rice) from *Dhan*, and for pounding bricks.
13. *Chou Rummu*, bhangy.
14. Plough, used by Parbuttiahs.
15. *Keka*, used to separate seeds from the cotton.
16. *Yeau*, spinning wheel.
17. Weaver's loom.
18. *Rool*, carpenter's adze.
19. *Phoho*, used as a saw.
20. *Daha*, carpenter's chisel.
21. Lamp.
22. Tulip.
23. Specimen of *Gapgy* upland rice.
24. Ditto of rice in the valley of Nipál.
25. Ditto of variety of rice called *Malsi*.
26. Two specimens of mustard seeds.
27. Specimen of pea stalactite.
28. Ditto of Nipál soap.
29. Two pen cases and inkstands.
30. Two inkstands.
31. Two *Buddhas*.
32. Nipál sword.
33. Ditto ditto.

Also the following Nipalese Musical Instruments:

1. *Phonga*, (trumpet,) Newarí.
2. *Mohalli*, (flageolet,) ditto.
3. *Singha*, (horn,) Nipál.
4. *Nug Pheni*, or *Turi*, Parbattiah.
5. *Bansuli*, (flute or fife.)
6. *Beli* or *Krishna Beli*, Newarí flute.

Also, several specimens of Cotton and Woollen cloth manufactured at Nipál, Tibet, and Bhoote, marked from No. 18 to 23.

Physical.

The Secretary presented, in the name of Mr. W. Cracroft, a very fine collection of the fossil impressions of vegetables and fossil woods in the coal and shale of Newcastle in New South Wales, just received from that place, along with a number of geological specimens and many rare shells, encrinite, &c.

Mr. C. Betts presented a piece of fossil wood from the sandstone above the coal beds of Burdwan; to which the natives give the name of *Asurhár*, or "giant's bone."

Three specimens of soil, and five of minerals, of Nipál, and a collection of skins of birds, presented by Dr. A. Campbell of Nipál.

A stuffed Albatross, presented by J. Child, Esq. H. C. Pilot Service.

A specimen of *Eurinorynchus Griseus*, or Pigmy Spoonbill, presented by —— Newcombe, Esq.

This bird is one of the rarest in the world; but a single specimen having been found before: the Curator was requested to draw a description of it for publication.

A specimen of *Remora*, presented by C. W. Smith, Esq.

A note on the *Chœrotherium*, one of the new pachydermatous genera, discovered in the Siválik range, by Messrs. Falconer and Cautley, was read.

The letter accompanying it notices the discovery also of the remains of birds, in the same rich fossil field.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of February, 1836.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	Standard Barometer, at 32°.	Wet Barometer, at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at 32°.	Aqs. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.
1	30,034	,272	0,762	71,4	2,7	2,2	96	,899	,026	,873	74,8	5,7	6,0	93	60,1	93,6		e.	sw.	sw.	clear.	hazy.	cumuli.
2	,928	,126	,802	72,8	3,2	3,0	97	,828	,980	,848	74,3	5,9	6,7	89	65,3	90,6		W.	sw.	sw·	rn. mist.	cumuli.	misty.
3	,976	,198	,778	72,0	9,0	9,7	80	,860	,038	,822	73,9	9,7	11,0	74	57,1	86,4		o.	Ne.	ne.	cirri.	fine.	fine.
4	,007	,230	,777	71,7	10,3	11,9	71	,889	,049	,840	74,2	10,9	11,1	68	54,5	88,3		o.	ne.	ne	do	do	do
5	,020	,248	,772	72,0	11,3	13,0	69	,906	,058	,848	74,1	13,3	15,4	64	50,4	87,7		o.	nw.	nw.	hazy.	clear.	clear.
6	,018	,249	,769	71,9	11,0	9,7	81	,896	,048	,848	74,7	12,8	14,0	68	52,3	88,4		o.	nw.	sw.	foggy.	do	do
7	,006			70,3	9,9			,858			77,8	16,0			50,0	88,0		o.	o.	o.	do	do	do
8	,896	,124	,772	72,1	7,3	8,0	87	,764	,898	,866	75,4	12,2	13,8	69	54,0	87,7		o.	nw.	W.	thick fog.	do	fresh breeze.
9	,848	,096	,752	71,6	6,9	7,5	88	,712	,780	,932	77,0	13,0	13,5	72	61,8	91,8		o.	nw.	sw.	clear.	do	fine.
10	,864	,028	,836	74,6	3,7	4,0	94	,778	,846	,932	77,3	6,2	6,9	91	63,0	88,2		S.	sw.	sw.	scud.	cir.cumulus.	cir.hh.sq. nt.
11	,949	,131	,818	73,8	7,8	9,0	81	,806	,890	,916	76,9	7,1	8,4	86	61,3	84,8		SE.	SE.	se.	cum . cir.	do	fine rn. at nt.
12	,946	,149	,797	73,0	4,8	5,0	93	,806	,948	,858	75,0	5,9	7,0	87	60,8	75,2	1,80	nw.	nw.	W.	cloudy.	cloudy.	nimb.hrn.nt.
13	,880	,118	,762	72,0	4,6	4,0	96	,799	,948	,851	74,7	7,0	6,9	90	58,4	79,2	,20	nw.	sw.	W.	overcast.	cumuli.	cumuli.
14	,958			68,4	4,4			,897			73,2	7,9			60,5	80,4		e.	e.	w.	cirri.	overcast.	cloudy.
15	,946			68,5	7,3			,875			72,0	12,0			57,0	73,4		e.	E.	o.	cir. stratus.	do	do
16	,954			68,7	8,7			,804			75,2	13,0			56,5	76,2		E.	se.	ne.	cir. cumulus.	do	fn.st.rn.atnt.
17	,986	,284	,702	69,1	4,2	3,2	97	,915	,210	,705	69,4	4,5	3,7	96	58,5	67,3		E.	ne.	E.	stormy.	drizzle.	fine showery.
18	,010	,316	,694	68,9	3,5	3,3	88	,899	,140	,759	70,6	3,2	3,6	96	58,7	76,8		e.	ne.	ne.	cumuli.	overcast.	cdy. shower.
19	,036	,310	,726	69,7	4,9	4,0	95	,946	,194	,752	70,5	8,2	8,0	82	60,7	75,7		n.	nw.	o.	scud.	stratus.	do
20	,098	,436	,662	67,9	9,3	8,4	79	,010	,264	,746	70,3	10,4	9,7	75	49,2	77,2		o.	nw.	nw.	fog.	fine.	clearing.
21	,099			64,5	7,6			,988			69,8	14,0			50,3	76,8		o.	o.	nw.	clear.	do	fine.
22	,080	,349	,731	70,0	8,0	7,8	83	,936	,164	,772	71,8	9,1	8,2	83	50,0	84,2		o.	ne.	n.	do	clear.	clear.
23	,048	,278	,770	71,3	5,7	4,8	95	,920	,028	,892	75,6	8,6	7,3	89	53,1	84,8		E.	SW.	ne.	do	cumuli.	do
24	,024	,232	,792	72,8	4,0	3,1	97	,918	,056	,862	74,9	10,4	9,3	80	59,3	88,2		o.	SW.	sw.	do	do	do
25	,033	,232	,801	73,0	11,3	11,7	74	,914	,049	,865	75,4	14,0	12,2	69	55,4	85,2		W.	sw.	sw.	do	clear.	do
26	,003	,216	,787	72,5	13,8	12,5	71	,879	,028	,851	74,9	15,7	13,3	66	56,0	83,0		W.	nw.	sw.	do	do	do
27	,969	,196	,773	72,3	13,4	13,0	70	,820	,959	,861	75,4	17,0	15,4	60	55,0	83,8		nw.	nw.	nw.	do	do	do
28	,874			70,8	7,7			,764			77,5	16,6			55,0	84,3		n.	w.	nw.	do	do	do
29	,884	,094	,790	72,8	8,7	8,0	87	,762	,820	,942	77,5	15,0	13,2	75	54,2	91,0		o.	nw.	sw.	do	do	do
Mean,	29,977	29,213	0,766	71,1	7,4	7,2	86	,874	,018	0,845	74,3	10,5	9,7	79	56,5	83,4		variable.			unusually cold—a heavy fall of rain.		

We beg to correct a trifling mistake in our note on Mr. Barrow's horary barometrical observations, published in our last number. The first barometric column contains the actual readings, and are not, as we supposed, corrected for capillarity of tube—this correction is applied along with correction for temperature to the "Bar. at 32°" column: the equation to reduce the observations to our own instrument is correct.

We are now happy to announce the safe arrival of our standard Barometer from England, the duplicate of the Royal Society's instrument. It will in future be registered.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 51.—*March*, 1836.

I.—*Memoir of the Life and Writings of St.* Nierses Clajensis, *surnamed the Graceful, Pontiff of Armenia. By* Johannes Avdall.

[Submitted to the Asiatic Society, 1st May, 1829*.]

At a period when Armenia was labouring under the lamentable effects of intestine broils and foreign invasions; when she was subjected to the ruinous consequences of dissensions that existed between the leaders of the Armenian and Greek Churches, when tyranny and persecution of the most violent kind strode hand in hand in her territories, Providence deemed it necessary, out of sympathy for the sufferings of human beings, to raise up a person, who, by a happy combination of the qualities of a great mind, with those of a good heart, might be a proper instrument of knitting more closely man to man, and of removing disturbances from the Church of Christ, whose very essence is formed of love, meekness, and peace.

The individual, in whom the illustrious subject of this Memoir found a father, was called Apirat, a prince famed for uncommon bravery and glorious achievements, who flourished in Armenia near the close of the eleventh century. He claimed his origin from the Pehlavic race, and had the happiness of perpetuating his memory by giving birth to four sons, known under the appellations of Basil, Shahan, Gregory,

* This paper was handed to us by a Member of the Committee of Papers of the Asiatic Society for 1829, on his departure for the Cape. It had been unfortunately mislaid among his papers. Although, (as the author's presentation letter says,) "it is not of a scientific nature, and consequently little adapted to the taste of the present age," still, considering that it is descriptive of the public acts of the greatest author and divine that flourished in Asia in the middle of the 12th century, and illustrative of the religious differences that separate the Church of Armenia from that of Greece, it cannot fail to interest many of our readers.—Ed.

and NIERSES. The latter was born in the year 1100, in the castle of Zovs, which was the hereditary property of APIRAT. Allied by the ties of consanguinity to GREGORY VIKAYASER*, who then wielded the pontifical sceptre in Armenia, APIRAT entrusted to him the education of GREGORY and NIERSES, who were, by the direction of their guardian, admitted into the monastery raised on the summit of the Black Mountain. GREGORY VIKAYASER, when he had attained to a good old age, was by the repeated solicitations of the prince BASIL the Sly, and his illustrious lady, induced to change the place of his residence, and spend the remainder of his days near them, at Rapan, situated in the vicinity of the city of Cheson. On his departure from the monastery of the Black Mountain, he took with him his wards, GREGORY and NIERSES, having entertained favourable anticipations of their future greatness and celebrity. Some time after his having eventually settled in the Red Convent, near Cheson, perceiving that his career was daily drawing to a close, he sent for PARSICK, whom he had previously nominated his successor, and for BASIL the Sly, to whose kind care and protection he intrusted the lads GREGORY and NIERSES, the former being of the age of about 13 years, and the latter only 10 years, old. He also added, in the presence of those by whom he was surrounded, that, agreeably to his nomination, PARSICK should immediately after his death be invested with the pontifical authority of Armenia. On the elevation of the latter to that high station, he began to shew the greatest regard for the welfare and education of his wards, GREGORY and NIERSES, and accordingly placed them under the superintendence of Bishop STEPHEN, a divine of high attainments and profound erudition, in order, that they might by his immediate tuition be instructed in theology and the literature of the west. GREGORY and NIERSES continued to proceed in their education with two other fellow scholars, named SARKIES† and IGNATIUS, whose valuable productions have perpetuated their fame in the recollection of posterity.

* Vikayaser (Վկայասէր) is the compound of Վկայ martyr, and սէր love, signifying *lover of martyrs*, which is an epithet given to GREGORY in consequence of the extreme veneration which he displayed for the memory of martyrs, and the great avidity with which be translated their lives from the Greek and Syriac languages.

† These two worthies are peculiarly distinguished among the divines, who flourished in Armenia in the twelfth century. At the special desire of the pontiff GREGORY, IGNATIUS wrote a commentary on the Gospel of St. Luke, which is held in general admiration for the perspicuity of its style and the sensible observations with which it abounds. SARKIES claims an equal share of veneration from his countrymen for his valuable productions, which have been handed down to us. They consist of Commentaries on the seven General Epistles, on

Parsick having established the seat of his pontificate at the desert of Shughr, in the vicinage of Cheson, felt great interest in frequently visiting the Red Convent, in order that his occasional presence might enhance the utility and efficiency of the institution. Two years after this, considering that the qualifications and good conduct of Gregory were worthy of sacerdotal dignity, Parsick conferred on him the order of priesthood, when he had just attained the age of 15 years. Removed from the Red Convent, Gregory remained with Parsick in the pontifical house, where the latter with paternal care and exertions instilled into the mind of the former such principles of virtuous habits and sound doctrine, as might befit him for the high office which he was destined to fill.

Having enjoyed the pontifical authority for about eight years, Parsick was cut off by sudden death. Before, however, this melancholy event, he summoned the dignitaries of the church of Armenia, as well as some of the nobility of the country, and in their presence, nominated his ward Gregory as successor to the pontificate, presenting him with his pontifical robes and sceptre. Accordingly, the bishops and clergy of the nation having assembled in the Red Convent, anointed Gregory with great honors Pontiff of all Armenia. Though of the age of twenty years only, the mental and moral qualities of Gregory peculiarly adapted him for the responsibility of the high situation.

Gregory having, by new improvements, strongly fortified the castle of Zovs, which had devolved on him after the death of his father, removed thither the seat of his spiritual government. After the lapse of several years, Nierses, at the particular desire of his brother Gregory, quitted his monastic seclusion, and entered into clerical orders. During the ceremonies of his ordination, the pontiff Gregory bestowed on him the appellation of Nierses, in veneration of the memory of Nierses the Great*, who was of Parthian and Pehlavic extraction. By what name he was originally designated, no mention is made in the works of any of our historians. His profound learning and exemplary virtues soon raised him to the high dignity of a bishop, in whose capacity he was from time to time sent by the pontiff on visitations to the most populous provinces of Armenia, for the purpose of enlightening the minds of the ignorant, and pouring the balm of comfort into the hearts of the afflicted. Wherever he visited, his footsteps were marked with

the Prayers of St. Gregorius Narekensis, and on the Prophecy of Isaiah. That of the General Epistles was published in Constantinople in the year 1744; but those of the two latter have not as yet been discovered.

* For particulars of the life of Nierses the Great, vide my translation of the History of Armenia, vol. i. page 181.

national improvements and spiritual good. By his peculiarly mild temper and upright principles, he was held in general estimation, and considered a very valuable member of the fraternity to which he belonged.

At this period, it must be recollected, the city of Antioch was in the possession of the Latins, who found it necessary to convene a general assembly for the purpose of taking into consideration some heavy charges that were preferred against RODOLPH, the Archbishop of that city, to his holiness INNOCENT the Second. Being deservedly distinguished among foreigners for the intense zeal they displayed both in the cause of Christianity and humanity, the pontiff of Armenia and his brother NIERSES were invited to become participators in the proceedings of the council. They met with a very honourable reception from the Latins, whose admiration of the graceful tone of their conversation could only be equalled by the surprise with which they caught every sentiment which fell from the lips of those bright ornaments of the Armenian church. On the conclusion of the meeting, which led to the deposition of RODOLPH from his episcopal dignity, the pontiff GREGORY went on a pilgrimage to the city of Jerusalem, and his brother NIERSES having returned to the castle of Zovs, performed the duties of a proxy during the absence of his brother from the seat of his pontificate.

Dissensions now arose among the Armenians and Syrians residing in some part of Mesopotamia, through the dissemination of the heretical doctrines of the Thondrakian sect*, which were calculated to mislead the simple and the illiterate. THULKURAN, an Armenian nobleman, eminently distinguished for his exemplary piety and benevolence, viewed the progress of these heresies with great apprehensions for the safety of the established Church of Armenia, and in consequence, endeavoured to check the evil, by communicating the state of things to the pontiff GREGORY, and soliciting him to take measures for effectually exterminating the sect. The latter, after giving the subject due consideration, communicated with his brother NIERSES on the best way of pro-

* The founder of this sect was an Armenian by the name of SUMBAT, who flourished in Armenia in the beginning of the ninth century. He was born in Zarehavan, a village situated in the province of Zalcotin ; but in consequence of his long residence in Thondrak, he received the appellation of Thondrakensis, and his followers were known by that of Thondrakians. His mind was imbued with the heretical principles of the Paulicians, and the whole course of his life was marked with the greatest moral depravity, impiety, and wickedness. Like the Sadducees, he disbelieved the doctrine of future rewards and punishments, and in imitation of the opinions of EPICURUS denied that God was the creator and preserver of the world. He refused his assent to the creed of the graces of the Holy Ghost, the efficacy of the Sacraments of the Church, and the existence of sin, laws, and justice.

tecting the Church from the impending danger, and imposed upon him the task of addressing a general letter to the Armenian inhabitants of Mesopotamia, descriptive of the confession of the orthodox faith of the Armenian Church, and contradictory of the heterodox opinions of the Thondrakians. NIERSES performed the injunctions of his brother in such a successful manner, as to silence those who were inimically disposed towards the Church, and to restore peace and unanimity amongst the community of that place.

In the year 1142, the Grecian emperor JOHANNES PORPHYRIGENITUS led a considerable army into the country of Cilicia, in order to put down the power of the Scythians, which had already begun to assume a formidable appearance in that quarter. During his short stay in the city of Anarzaba, the emperor expressed a desire of having an interview with the Armenian pontiff GREGORY and his brother NIERSES. On their being presented to the emperor, they met with a kind reception, and were seated next to his imperial majesty. A conversation then ensued relative to the doctrines and ceremonies of the Armenian Church, and the sound judgment with which they answered the interrogations of the emperor, excited his regard and admiration. This afforded him a favourable opportunity of acquiring a correct notion of the state of the Armenian Church, and of removing from his mind that unjust prejudice with which he was in the habit of viewing the Armenians. The example of their monarch was soon followed by the majority of the people, who began to relax in the persecution with which they afflicted a nation whom by a common faith they ought to have protected from similar cruelties, when inflicted by the unbelieving Musulmáns.

Apprehensive, through the perturbed state of the country, of an attack upon his paternal castle of Zovs by foreign invaders, the pontiff GREGORY consulted his safety by quitting the place of his residence, and fixing the seat of his pontificate in the fortress of Hiromcla. Built on the confluence of the rivers Marzman and Euphrates, and strongly fortified by nature, Hiromcla proved an insuperable bar against an invasion. Formerly it was in the possession of the prince BASIL the Sly, and now it was under the control of the countess JOSCELYN. The pontiff GREGORY and his brother NIERSES met with a very hospitable reception from this illustrious lady, who felt the greatest delight in rendering their situation comfortable, and was exceedingly pleased with their charming and edifying conversation.

On the decease of her husband, who had been seized by NOURED-DIN*, the chief of Aleppo, and who died in confinement, the dowager countess JOSCELYN thought it safe to quit Hiromcla for Europe.

* MILLS's History of the Crusades, vol. i. p. 309.

Previously, however, to her departure, she made over the management of the fortress to the pontiff GREGORY and his brother NIERSES on the following condition: "I am about to quit this place," said she, "and proceed to my country. I leave this fortress as a trust in your hands, with a desire that in case my son happen to come to this quarter, you shall deliver it over to him as his patrimonial property; but if otherwise, you shall be entitled to its possession." On the arrival of young JOSCELYN in Hiromcla, he was made master of it in conformity with the desire of his mother. After a short residence in this place, JOSCELYN determined to quit it for Europe. In consequence of this intention, the fortress was sold to the Armenian pontiff GREGORY, who, according to the historians VARDAN and KIRAKUS, established in it the seat of his pontifical government, and raised there a very magnificent Church, embellished with splendid cupolas.

About the year 1165, when GREGORY had attained to a good old age, and enjoyed the pontifical office for a period of 53 years, he began to be solicitous for the nomination of a successor. He expressed a desire of conferring that spiritual dignity on his brother NIERSES, who was also past the meridian of life. The latter, though the offer was several times made to him by GREGORY, was unwilling to accept it. Finally, anticipating the approach of his death, GREGORY ordered a general meeting of all the Armenian bishops, monks, and priests to be held in the pontifical house at Hiromcla, for the purpose of considering the best mode of nominating a successor to the pontificate. In this assembly, after making an impressive speech on the approaching termination of his career, and the necessity of electing a successor worthy of the high station which be filled, he expressed his choice of investing his brother NIERSES with the pontifical authority, which proposition met with the unanimous and cordial approbation of the audience. NIERSES, who had made up his mind to exchange the troubles of a busy life for the sweets of solitude, in vain endeavoured to decline the offer of that responsible situation. Overcome by the repeated solicitations of the assembly, he was at last obliged to accept the office of the pontificate, with a view of promoting the general welfare of the nation. Immediately after this, GREGORY anointed NIERSES pontiff of all Armenia, and adorned him with the pontifical robes. He placed in his hand the sceptre of authority, and saluted him with the greatest reverence and submission as the head of the Church. When the ceremonies of the election were over, NIERSES rose and delivered a most excellent speech, expressive of his acknowledgments for the high honor that had been conferred on him, and descriptive of the nature of the responsible duties which he was bound to perform in the spiritual dignity to which he

was elevated. By this oration the audience were not only assured of the zeal and interest which he would feel for the welfare of his flock, but were also struck with a forcible conviction of the goodness of the heart and the grandeur of the mind, from which these graceful sentiments emanated. It was owing to a peculiarly sweet tone of his expressions, and a remarkably fascinating flow of the sentiments of his inspired mind, that he was distinguished by the appellation of the Graceful, Շնորհալի, as he was latterly known by the cognomen of CLAJENSIS, Կլայեցի in consequence of exercising the functions of his sacerdotal office in the fortress of Hiromcla. About three months after the election of NIERSES, his brother GREGORY departed this life *Anno Domini* 1166, and was entombed in a sepulchre prepared during his life time.

Soon after the death of his brother, NIERSES, the pontiff, set about improving the state of the churches, and promoting the spiritual welfare of his flock. And as the Armenians in that time, like those in our days, were dispersed in various parts of the globe, that is to say, in the territories of Armenia, in Greece, Persia, Georgia, Aluans, Egypt, and other quarters, he found it essentially necessary to extend spiritual comforts even to his distant congregation, by sending to them pious and able missionaries, for the purpose of curing the wounds of the afflicted, and enlightening the minds of the ignorant. Not contented with the good that was likely to result from the zealous exertions of these preachers of the gospel, he, at the early part of his pontificate, and by the unanimous consent of his bishops, addressed a general epistle at great length to the people of his Church, which was couched in sentiments full of heavenly wisdom*. In this letter, after mentioning the death of his brother GREGORY, and taking a short view of the relative duties imposed upon him by his being elevated to the pontifical throne, he states the orthodox creed of the Church of Armenia, which is immediately followed by preceptive exhortations best adapted to persons of every age and rank. The letter itself is divided into different sections, the first of which is directed to conventuals, who are assimilated to the stars; the second, to the primates of monasteries, who are compared to the eyes; the third, to the bishops, who are likened to the head, countenance, and stewards; the fourth, to the priests, who are made to resemble parents; the fifth, to the nobility; the sixth, to the military order; the seventh, to the citizens; the eighth, to the husbandmen and peasantry; and the ninth, to the female sex in general. The immediate object of the writer was to excite a love of virtue and piety amongst his congregation, and to be instrumental in eradicating from their

* This pastoral epistle was published in Venice with a Latin translation in the year 1829.

minds such unwholesome principles, as are calculated to render human nature waste and deformed. There are also extant several epistles written by NIERSES to different individuals, about matters temporal and spiritual, amongst which his correspondence with the authorities of Greece, relative to the contemplated union of the Greek and Armenian Churches, claims pre-eminence. Of this I shall have occasion to give a detailed account in the following pages :

The attention of NIERSES the Graceful was chiefly engrossed by a fervent desire of introducing various useful plans of improvement into the Church of Armenia. He succeeded in his endeavours of reforming it from the remnants of those irregularities, which were some of the baleful consequences of foreign invasions, and which were still predominant in several parts of Armenia. He strove with great vigilance to restore to the Church that splendour, which it enjoyed during the glorious reign of the Christian kings of Armenia. He ordered old copies of the Prayer Book of the Armenian Church to be brought to him from various distinguished monasteries of Armenia major, and by a careful comparison of their contents, he modelled the liturgy with considerable improvements, which is to this day in general use amongst all the Armenians. He made several additions to the Prayers that were read on Good Friday and the Pentecost. According to the authority of MUKHITHAR, the pontiff, it appears that up to the time of NIERSES the Graceful, the Church of Armenia performed the ordination of priests and bishops conformably to the custom and ceremonies of the Greek Church ; but NIERSES, on his elevation to the pontifical throne, adopted a new mode of ordination, not materially different from those of the sister Churches.

Prior to the beginning of the twelfth century, poetry was a perfect blank in Armenian literature. Though metrical pieces and songs can be traced in our history to have been repeated and sung by the Armenians in different periods, yet no record is handed down to us as to the existence of regular poetry in the Armenian language. According to a faithful writer* of that time, great credit is due to NIERSES the

* NIERSES LAMBRONENSIS, a contemporary and relation of NIERSES the Graceful, pays a handsome and just tribute to his genius, learning, and virtues in a poetical panegyric which he composed on him shortly after his death. In alluding to the honor due to him for his being the first who introduced poetry into the Armenian language, the panegyrist writes thus :

Հոմերական տայից չափօղ.	" Who first with grace Homeric numbers strung,
Յոանաւոր տաւից գոօղ.	And touchingly in fair Armenia sung,
Ի հոգևորան զնոյն տուօղ.	His verses soothe and elevate the soul,
Որով զսիրտս կարծրըր ճմլօղ:	And bend our stubborn hearts to their control."

Graceful as the first poetic writer in Armenia, whose talented productions have deservedly gained him the title of the Prince of Armenian Poets. Gifted by nature with a great genius, NIERSES devoted his leisure to the composition of melodies, anthems, and hymns, which are to this day sung in our Church to the admiration of all. Some of these poetical pieces are acrostic, the first letters of the stanzas composing the name of the author or the entire alphabet of the Armenian language. He also wrote several treatises and panegyrics, both in prose and verse, on dominical feasts, patriarchs, martyrs, and angels. During the days of his priesthood, he composed a brief history of Armenia in verse, from the period of HAIC to the twelfth century. A variety of miscellaneous pieces are also extant by this author, several of which he wrote before his elevation to the pontifical throne. At the express desire of his nephew APIRAT, he produced in verse a pathetic Elegy on the destruction of the devoted city of Edessa by the victorious army of ZENGHI, the chief of Aleppo, which memorable event took place on the 23rd of December, 1144*. This little work, which abounds with vivid descriptions and patriotic feelings, was for the first time published at Madras in the year 1810. Another edition of it was lately published by the Asiatic Society of Paris. The European public may shortly expect an English translation of it, which I have undertaken to execute†. On his being raised to the dignity of a bishop NIERSES produced another excellent work entitled Յ՚ Որդի "Jesus the Son‡," which is a poetical description of the principal events that are recorded in the Old and New Testaments. During this time he composed that admirable prayer which commences with "I confess with faith," Հաւատով խոստովանիմ, and which is now so popular amongst the generality of the Armenians. It consists of twenty-four verses, typical of the twenty-four hours of the day, and the number of the books of prophecy. Regarding this prayer, the author says in the records of old manuscripts, "I have written this in a plain and easy style, that it should be intelligible to general readers." It is held in such great estimation by my countrymen, that a translation of it into twenty-four languages was published in the year 1823 by the Mukhitharian Society in Venice! NIERSES was not unaware of the benefit of combining *utile dulci* in the variety of his literary productions. He

* MILLS's History of the Crusades, vol. i. p. 307.

† The Armenian text was published at Calcutta in 1832. The translation has not yet appeared.—ED.

‡ This work is very popular with the Armenian literati, and has run through several editions, the latest of which was published at Venice in the year 1830.

wrote several entertaining fables and pleasing enigmas, with a view of affording to his countrymen a source of innocent pleasure of the mind. Besides those already enumerated, he produced several other little works, which, like many valuable antiquities, have not escaped the devouring jaws of time.

The fame of the sanctity and wisdom of NIERSES the Graceful having spread through various countries of the globe, many distinguished individuals addressed him letters comprising questions on the most difficult points of religion, which he answered with such skill as to carry conviction to the mind of every reasonable being. At the special desire of VARDAN, one of the venerable monks of the convent of Haghbat, he undertook writing a commentary of a sublime panegyric on the Holy Cross, the production of David the philosopher, distinguished by the cognomen of the Invincible. When the work was completed and presented to VARDAN, he highly admired the profound learning and the inspired sentiments with which it abounded. There are also a few philosophical treatises extant in our language, which some of our historians attribute to the pen of this bright luminary of the Armenian Church.

Great intimacy existed between NIERSES and GEORGIUS, primate of the convent of Haghbat, who was eminently distinguished for his piety and rectitude of conduct. The latter, who held a constant communication with the former, solicited him in a letter to use his endeavours to procure a copy of the Memoirs of ST. SARKIES the General. NIERSES succeeded in obtaining the work, which was written in the Syrian language. He ordered it to be translated into Armenian by a Syrian priest, named MICHAEL, who was tolerably conversant with the Armenian language. This translation was subsequently revised by NIERSES in the year 1156, while he was a bishop. A copy of this work, written in Hiromcla, in the year 1198, about twenty-five years after the death of NIERSES, is preserved in the library of the Mukhitharian Society at Venice. Annexed to this work, which appears to have been transcribed from the manuscript of NIERSES himself, is a commentary of the general Epistles of St. JAMES, St. PETER, St. JOHN, and St. JUDE, written in a concise and comprehensive style, and compiled from the works of Greek and Syriac theologists, whose names are specified. But who was the compiler of this work is not known, as no mention is made of him in the old records. In another copy of the same, which was written in the year 1335 at the convent of St. THADDEUS, situated in the province of Artaz, the compilation of the work is attributed by the transcriber to NIERSES. This is, however, a mere conjecture, for it can be clearly perceived from the style that it is not the production of

Nierses. Perhaps a transcript made by him from the original was left in the pontifical house at Hiromcla.

In the evening of his life, Nierses commenced writing a commentary on the Gospel of St. Matthew. He had performed it as far as "Think not that I am come to destroy the law or the prophets : I am not come to destroy, but to fulfil," when the termination of his earthly career put a stop to its completion. After the lapse of a considerable time, it was finished by Johannes Zorzerensis. There is another work by the talented Nierses, which was intended as a guide for monastic life, and which he wrote while he enjoyed the dignity of priesthood. The profound learning which characterises his writings, the peculiarly beautiful style in which they are composed, and the divine spirit of benevolence which pervades every page of his compositions, are convincing proofs that the author of them was endowed with a mind of most extraordinary powers, and filled with divine inspiration. His voluminous lucubrations, which have been handed down to us by the unanimous applause of past generations, are highly creditable both to his head and heart as a man, a patriot, a divine, and a philosopher. Few can rise from the perusal of his works without being moved by feelings of reverence and admiration for the greatness of the mind from which they have emanated. Nierses Lambronensis, the grandson of General Shahan, the brother of Nierses the Graceful, who was one of his distinguished contemporaries, and had many opportunities of personally experiencing his mental and moral qualities, pays a just tribute to the memory of this paragon of learning in a poetical panegyric which minutely treats of the many amiable virtues with which he was adorned. The panegyrist properly dwells on the meritorious exertions, which Nierses the Graceful made to promote the public good, on his exemplary piety and devotion, his rigid and abstemious habits, his continual studies and philosophical reflections, and the warm sympathies with which his heart glowed in relieving the distress of the poor, the orphan, the widow, the sick, the captive, and others who were doomed to suffer miseries and calamities.

During the pontificate of Nierses the Graceful, there still appeared in some parts of Armenia remnants of a peculiar tribe of Armenians, known under the appellation of Արևորդիք Arevordies*, (the Sons of

* This people had probably derived their mode of worship from the ancient Persians, and perfectly agreed in the tenets of the Guebres of the present day. They adhered to the doctrines of Zerdasht or Zoroaster, who considered the sun as the grand receptacle of fire, and placed the existence of the Deity in the fiery element spread over all the universe.

the Sun,) who had continued in their ancestorial superstitions, and not deviated from paying homage to the sun since the days of GREGORY the Illuminator, the second Apostle of Armenia. Through the zealous exertions of the Armenian missionaries, whom the pontiff NIERSES sent to different quarters of the country, the darkness of paganism, that had so long overhung the heads of these unbelievers, gradually began to vanish, and after the lapse of a few years, the whole of that tribe embraced Christianity, and were admitted into the fellowship of the Church of Armenia.

Contemporary with NIERSES the Graceful, there was in Armenia MUKHITHAR, an assiduous follower of ÆSCULAPIUS, and eminently distinguished for his Medical and Astronomical knowledge. He had the gratification of cultivating the friendship of NIERSES, from whose conversation he derived the greatest delight and spiritual comfort. At the particular request of this celebrated naturalist, NIERSES wrote a beautiful poem, descriptive of the beauties and excellencies of heavenly bodies. He added to it another small poem on the Creation of the World, and the mystery of the incarnation of our Saviour*. The latter is acrostic, the first letters of the verses of it composing this sentence Մխիթար բժիշկ՝ ընկալ ՚ի Ներսէսէ զայս բան: "Doctor MUKHITHAR, accept from NIERSES this poem!" I hope it will not be considered here out of place to say, that this learned physician has left a very valuable work on Medicine, which is replete with wise observations and useful experiments. It was composed during the time, and by the desire, of GREGORY the pontiff, the successor of NIERSES the Graceful†.

One of the most remarkable actions that marked the earthly career of NIERSES the Graceful, was the contemplated union of the Armenian and Greek Churches. This desirable object, which originated from a most unexpected event, was undertaken during the life time of his brother GREGORY, the pontiff, and prior to his being invested with the supremacy of the Church of Armenia. But alas for the peace of Christianity! before the laudable undertaking was carried into execution, both Armenia and Greece were unexpectedly deprived of the only instruments by which such a happy change possibly could have been effected!

During the last days of the pontificate of GREGORY, dissensions arose between the two Armenian princes, THOROSE the Great Panse-

* These two little poems are also published in conjunction with the work called "Jesus the Son."

† This rare Manuscript work was discovered in the Royal Library of Paris, and published in Venice two years ago.

bastus and Lord of Cilicia, and Oshin the Sebastus and Lord of Lambron. The reason of this unfortunate difference was, that the former insisted upon the latter to profess obedience to himself, and to decline becoming tributary to the Greeks, while Oshin thought it safer to continue his allegiance to the Greek emperor, than to acknowledge the ascendency of Thorose. Blinded by selfishness, and provoked by mutual resistance, they were at last necessitated to have recourse to an appeal to arms, which was attended with fatal consequences to both parties.

The pontiff Gregory, viewing these unfortunate circumstances with a spirit of national sympathy, imposed upon his brother Nierses the task of effecting a reconciliation between the two princes by his mild and fascinating address. Nierses succeeded in his endeavours of restoring to them peace and friendship, which were soon after followed by a happy alliance between them, Thorose marrying his daughter to Hethum, the son of Oshin. On the celebration of this marriage, Oshin desired Nierses to accompany him to Lambron, with a view that its inhabitants might be benefitted by his edifying instructions and evangelical discourses. During their journey they had occasion to enter the city of Mamestia, which was then in the possession of the Greeks. Here they met Alexius, the protostrator or generalissimo of the Greek army, who was the son-in-law of the emperor Manuel, and had come thither with the design of visiting the frontiers that belonged to the Grecian empire. On his first interview with Nierses the Graceful, Alexius was struck with admiration by the grace and learning which pervaded every part of his conversation. One day religion being the topic of their conference, Alexius expressed a desire of being furnished with information as to the cause of the division of the Church of Christ into so many doctrinal opinions. The promptitude with which Nierses answered every question that was put to him, created in Alexius a deep sense of veneration for him as an erudite divine, and left no appearance of doubt in his arguments. Nierses convinced him that the difference of opinions between the Christian Churches merely existed in words and forms, and assured him that the creed of the Armenian Church was consonant to that of the Church of Greece.

Alexius desired Nierses to commit the whole of their conversation to writing, which he promised to present to the emperor, and to exert every nerve in effecting a union between the two Churches. He also proposed to him the solution of a few important points, which from their intricate nature had created a difference of opinion between the divines of the Greek Church.

Nierses accepted the proposition with great interest, and accordingly wrote an epistle to him full of sound doctrine and incontrovertible proofs. He commenced the latter by saying, "I was extremely delighted by the opportunity of holding a conference with you, O philanthropic and pious nobleman, respecting the doctrines and forms of the Armenian Church! But as sentiments embodied by human utterance are liable to be effaced from the tablets of memory, by the lapse of time, by reason of the cessation of our remembrance, I do not hesitate to furnish you with a written account of all that you were pleased to hear from me. I shall endeavour to perform my task with as much propriety and precision, as my time and abilities will admit of. Encouraged by the love of knowledge, with which you are distinguished, I feel no small alleviation in the execution of my difficult undertaking. It may not be perhaps superfluous to add, that all my arguments are drawn from that pure source of religious truth, for which our divine fathers of old are so deservedly characterised."

This preamble is immediately followed by an orthodox confession of the Holy Trinity, and of the incarnation of our blessed Saviour. It is here asserted, that the Church of Armenia admits the duality of nature in Christ, and that the Armenians by the term "one nature," acknowledge by implication an unconfounded union of the divinity and human nature of our Saviour. It is also added that the Armenian Church, according to old customs, commemorates the nativity of our Saviour on the 6th of January, and that it is a gross fabrication that the Armenians observe the Annunciation day on the preceding day of the Epiphany. That in consequence of a want of olives, the Armenians make preparation of unction by the oil of odorous flowers. That they pay due reverence to pictures. That in constructing crosses of wood, nails are with no other intention affixed to them than with that of joining the parts together; while those made of silver and gold are without nails. That the prayer Ս֊ր֊բ Աստ֊ված "Holy God*," is offered in the Armenian Church to Jesus Christ, and not to the Father, or the Holy Ghost. That the custom of partaking of milk, butter, and cheese, on

* About half an hour previously to the commencement of high mass, the following short prayer is addressed to the Son in the Armenian Church: Ս֊ր֊բ Աստ֊ված, սու֊րբ և հզօր, սու֊րբ և անմահ, որ խաչեցար վասն մեր, ողորմեա մեզ: "Holy God, Holy and Mighty, Holy and Immortal; who wast crucified for us, have mercy upon us." An erroneous impression had been made on the minds of the Greeks, that this prayer was indiscriminately addressed to either of the persons of the Holy Trinity, and by this conviction, they traced a fundamental error in the doctrines of the Armenian Church.

Saturdays and Sundays during the lent, has now become obsolete amongst the Armenian people, and though it is still continued by a few of the nobility, its entire abandonment will be effected in a short time. That the custom of using pure wine, unmixed by water, in the Holy Communion, has obtained in the Armenian Church since the days of the blessed Gregory the Illuminator. Finally, the writer explains the nature of the abdomedal fasting, which is observed by the Armenians a few weeks before the commencement of the Lent.

Alexius, on receiving from Nierses the foregoing epistle, expressed his grateful acknowledgments for the same, and permitted him to take his departure for Lambron, after having bestowed on him every mark of honor suitable to his rank and office. Nierses having remained in the latter place for a short time, quitted it for Hiromcla, where he met his brother Gregory, the pontiff, and related to him every particular of the communication that had passed between him and the Grecian generalissimo Alexius.

On the fulfilment of the immediate object of the letter of Nierses the Graceful, on its being put into the hands of the emperor Manuel, and the patriarch Michael, they immediately ordered it to be translated into Greek, and felt great satisfaction at the opportunity that had offered itself of effecting a union between the Greek and Armenian Churches. The perusal of the translation filled their minds with admiration of the mild spirit and rare talents of the writer, and afforded them encouragement to carry the contemplated scheme into execution. Hereupon the emperor sent a deputation to Armenia, consisting of Sumbat and Arukh, both of Armenian extraction, with a letter to Gregory the pontiff, dated September, 1167, expressive of his earnest desire of seeing the consummation of the happy union which was in contemplation. In order to proceed in this undertaking with facility and success, he wished that Nierses the Graceful should be sent to Constantinople, thinking that the presence of both parties might in a great degree be conducive to an amicable settlement of the existing differences. The following is a copy of the letter in question :

" Manuel Comnenus Porphyrigenitus, ever mighty and great, Augustus, emperor of Greece, and faithful king of God Jesus Christ, to his holiness Lord Gregory, the excellent pontiff of Armenia, sendeth love and greeting. It is the imperative duty of all those, who by the medium of the baptismal font have entered into the fellowship of Christ, to have due regard for the fulfilment of divine justice, and to display special care and zeal for the advancement of love, peace, and unanimity amongst that class of people, who have Christ as the foundation of their religion. They are bound to use their unremitting endeavours to knit all the Christians with the bonds of union ; to make them followers of one shepherd, who became incarnate to save us from perdition, to bring them under

the guidance of one pastoral crook; to cause them to 'lie down in green pastures" of orthodox faith; to render them participators of the vital stream of wholesome doctrines, and to gather them within the pale of one Catholic Church. Elevated by Providence to the highest station that can be allotted here to a human being, I consider the duties of governing my empire less sacred, less beneficial, than those which oblige me to be instrumental in effecting an union of the Christian Churches. Impressed with this conviction, I shall, as far as time and circumstances will permit, strive to consummate an object, which involves the temporal and spiritual welfare of mankind.

"It is not less becoming to your excellent fraternity, who have made the scriptures and the laws of God your chief studies, and rendered yourselves conversant with the orthodox doctrines of the fathers of the Church, to use your friendly and influential co-operation in securing the welfare of the inward man, by collecting from the only source of life the dews of truth and salvation. Of your desire to promote this laudable object, we have been informed by our beloved son-in-law ALEXIUS, who delivered to us a letter bearing a detailed account of the conference that had taken place between you and him concerning the contemplated union of the sister Churches. It is our intention to give due deliberation to the state of the Armenian Church, and to institute inquiries into the creed thereof. A translation of the letter of your holiness was read by us with uncommon interest, and afforded us a source of the greatest satisfaction. Assured of the moral and Christian virtues, for which your holiness is so eminently distinguished, we feel real pleasure in rendering our aid to the consummation of an object highly desirable both to God and man.

"With this view we would propose to you to dispatch your brother NIERSES to our capital, as we are perfectly convinced that a man of his extensive information, varied knowledge, virtuous conduct, and amiable disposition, will not only be able to afford satisfaction to the Head of our Church, and the synod in general, but particularly tend to remove the difficulties which will otherwise be experienced from time and place. Let the insignificant cause of division, which subsists between the two Churches, be removed if it he within the scope of possibility; and let not Christ, who redeemed us from eternal punishment by his precious blood, be considered a stumbling block, but the Head of the corner and the True Foundation of our faith, which unites us together in spirit. Let Christ be the centre of all our religious inquiries, the Anchor of all our spiritual aspirations, and the Director of all our ecclesiastical affairs. In him we founded our belief, to him our hearts were fixed, and by him our wounds were healed. From the Great Bestower of so many blessings you will no doubt obtain for your zeal in the sacred cause of Christianity that recompence which is reserved for the enjoyment of the elect. We have thought it necessary to depute our faithful servant SUMBAT, bearing this letter, with directions to induce you to despatch your brother NIERSES to Constantinople. He is also authorised to give you such other information, as might have a connexion with the immediate object of his mission. You may safely credit all that will be said by him on this subject. Adieu!"

While preparations were in progress at the capital of Greece for depatching the embassy to Armenia, the pontiff GREGORY terminated his earthly career. The Church of Syria was also at the same time

deprived of its supreme pastor, whose station was immediately filled by an able and worthy successor. News of the proposed union of the sister Churches having spread throughout the Christian countries which held a close intercourse with Armenia, the patriarch of Syria deputed two learned bishops to Hiromcla, for the purpose of taking a part in the proceedings of the council, which was shortly to be held by NIERSES the Graceful, for furthering the views of the intended union.

On the arrival of the embassy at Hiromcla, SUMBAT delivered the imperial letter to NIERSES the pontiff, communicating to him many interesting particulars on the part of the emperor, and persuading him to accompany him to Constantinople ; but the duties of his high office rendering his absence from the pontifical house indispensable at that very juncture, NIERSES sent a reply to the emperor, full of spirit and wonderful observations. As the letter itself is of great length, I shall here only give an outline of its contents :

" I had the honor to receive the letter of your Imperial Majesty, addressed to my late lamented brother and immediate predecessor in the pontificate of Armenia. By the perusal of the inspired sentiments expressed in it by your godly Majesty, our hearts thrilled with that inexpressible delight which a person feels on recovering from the influence of sleep, and enjoying the vivifying beams of the glorious orb of day. It is gratifying to us to observe, that your Majesty is worthy of not only bearing the name of the true EMMANUEL, but also of his co-operation in ' breaking down the middle wall of partition *between us*.' Endowed with these peculiar gifts of heaven, your Majesty is condescendingly pleased to accost us with a cheering voice, and propose measures for eradicating from amongst us that hatred, which has proved so baleful to the interests of Christianity, and the welfare of our country. I am so exceedingly delighted with your Majesty's invitation, that I would, even if I were dead, like LAZARUS, arise from the grave, and obey the divine voice which summons me to your presence ; but violent disturbances abroad, and the urgent duties of my avocation at home, present insuperable barriers to my paying a visit to Constantinople. Notwithstanding these obstacles, I should still feel diffident to attempt discussing a question of so much weight in your august presence, from a conviction that the sphere of my knowledge would look like a mere drop in comparison with the vast ocean of your Majesty's qualifications. All that were great and noble in Armenia, to our national misfortune, have now ceased to exist. The only comfort, with which we cheer our hearts in the melancholy gloom that overhangs our civil destinies, is derived from the circumstance of our Church being based on the solid foundation of Catholic faith. We place our confidence in the mercies of God, that the divine power which excited love and good-will amongst us, shall consummate a happy union between the two Churches.

" Should your Imperial Majesty be graciously pleased to visit Armenia, for the furtherance of this desirable object, you will, by that act of condescension, display in your soul the stamp of that humility, with which the heavenly King came to the world to bestow salvation on mankind. We are sure that you will join with us in the conviction, that the lustre of glory reflected on your mighty empire by

splendid victories, and the aggrandizement of territories, will be cheerless and evanescent when contrasted with that of restoring peace to the Church of Christ, by blunting the weapons of the incorporate enemy, and suppressing envy and hatred, which like cankers have preyed on the very vitals of our spiritual existence. Our Lord Jesus Christ, viewing the baneful consequences of pride predominant in human nature, had recourse to humility as to an infallible cure of the spiritual infirmities under which mankind were labouring; and by means of his divine love and meekness, conciliated the hearts of those who were estranged from him by the infringement of his laws and ordinances. In imitation of the example set to us by our blessed Redeemer, it behoves your Imperial Majesty to make your dictatorial authority subservient to mildness and humility, in removing the cause of estrangement that exists between the two nations. As a tree which is bent to the ground is liable to be broken by a sudden and violent effort to restore it to its upright position, so a division amongst the members of Christ, rendered obstinate by time, is incapable of being removed by force. It stands in need of a long and patient application of spiritual ointment, I mean the exercise of a kind, mild, and conciliatory spirit on the part of your Imperial Majesty towards the Armenians placed under the sway of your government.

"Many of your people, to our great national misfortune, consider that the only means of conforming to the laws and justice of God, and of being worthy of inheriting the kingdom of heaven, consist in pouring upon us torrents of abuse, in destroying our Churches, in breaking our crosses, in overturning our altars, in ridiculing our religious ceremonies, and in harassing and persecuting the ministers of our Church. This unchristian animosity is carried to such a pitch, as to shame the horrid cruelties of the worst of unbelievers. Galled and persecuted by Moslem despotism, we have hitherto in vain sought protection in the sympathies of Christianity. Hence it must be inferred, that such a course of action not only fails to unite the divided, but tends to divide the united. The first effectual recipe, that can be applied to our spiritual distempers, is to make an exchange of the inveterate hatred for human love and kindness, and as a matter of consequence, to stimulate thereby the inhabitants of Armenia major to an acquiescence in the projected union. We humbly solicit your Imperial Majesty to order special prayers to be offered up in all the Churches throughout your empire, that the Almighty may be pleased to crown our undertaking with success. We have taken care that similar measures shall be adopted by our clergy in every quarter of Armenia.

"We have also particularly to request, that in case Providence assist us in discussing matters on the intended union in a general council, no mark of distinction or superiority should be observed between the Greek and the Armenian. Let no tone of authority be assumed by the former in denoting such points of the doctrines of our Church as are not accordant with those of yours, and no fault be imputed to the latter in boldly supporting the truths and dignity of their Church. Marks of distinction are only observable in the discussion of civil and temporal affairs. It is true that you claim pre-eminence in the attainment of knowledge and the exercise of earthly power; yet all those who are strengthened by the graces of regeneration in the baptismal font, are according to St. Paul 'one in Christ Jesus.' If, therefore, it may be pleasing to the Almighty to smile on our endeavours, and to bring our undertaking to a successful termination, we shall, in the assembly to be convened for the purpose, lay Christ

as the Rock and the Head of the corner over the two sundered walls of our Churches. Let not the subject be discussed with that fruitless and violent mode of controversy, which has hitherto been carried on by the sister Churches with detrimental consequences on both sides. Let brotherly love, unanimity, and an ardour after divine truths distinguish the whole course of the proceedings of the council. Let us, in accordance with the injunctions of St. Paul, bear one another's burden, and the infirmities of the weak, and so fulfil the law of Christ.' In laying open our spiritual distempers to the observation of one another, let each party reciprocally look for, in the other, a sympathising and confidential physician. Whatever may be beyond the reach of our penetration, let it be referred to the testimony of those whose judgment and experience have rendered them distinguished in the decision of similar questions. Able physicians do not consider their qualifications under-rated by taking medicines from the hands of their scholars, when they are labouring under the attacks of sickness. The eyes, though sharp enough in seeing the objects presented to their gaze, fall short of beholding themselves and the members of the body by which they are surrounded; and on their being attacked with soreness, they seek a cure from the eyes and hands of another. What has been stated above, will, we hope, be considered sufficiently satisfactory to your Imperial Majesty. We have communicated to you *multum in parvo*, and have desired your ambassador to furnish you with such other information, as may be thought to content the ardour of your curiosity. Adieu! Augustus Emperor! May your Majesty live long under the protection of the Almighty."

At the express desire of SUMBAT, who was at the head of the embassy, NIERSES the Graceful drew out another form of the Creed of the Armenian Church, being assured that it would tend to throw more light on the disputed points of religion, and carry conviction to the mind of every philanthropic inquirer. The contents of this letter were a clear, distinct, and comprehensive recapitulation of all that he had stated in the former one, presented to ALEXIUS, the son-in-law of the emperor. The letter commenced with the following beautiful preamble:

"It now becomes us to address ourselves to you, not with eloquence of speech, in which we are deficient, but in the truth of the spirit, in which we were instructed by those favoured with divine inspiration. We do not attempt giving colour to a schismatical darkness, by clothing our Creed with the light of orthodox faith, as we have unjustly been supposed to do by others guilty of a similar line of conduct; but what we have stored in the invisible spirit, we embody the same in visible writing, by the testimony of our minds, and the dictation of the Holy Ghost, who sees, judges and examines the utmost recesses of our hearts."

After making long and sensible observations on the mystery of the Holy Trinity, and the incarnation of Jesus Christ, leaning on the incontrovertible testimonies of the Fathers of the Church, he proceeds thus:

"Concurring in the fundamental principles of the Christian religion, we believe that the word, who was made flesh according to St. JOHN, was not changed into flesh by being divested of his divine nature, but that by an unconfounded

union with body, he was actually made flesh, and continued without flesh, as he was from the beginning. We believe that there are not two persons in Christ, one with flesh and the other without flesh; but that the very Christ is both with flesh and without flesh. He was made flesh by human nature, of which he partook, and remained without flesh in divine nature, which he had from the beginning. He is both visible and invisible, perceivable and unperceivable by the touch, beginning and unbeginning in time, the Son of Man, and the Son of God, coessential with the Father in divinity, and concomitant with us in humanity."

After taking a comprehensive view of the mystery of the incarnation of our Saviour, he dilates on His divine and human wills, and clearly demonstrates, that the will of the humanity of Christ was always and in every respect obedient to that of his divinity:

"The human will had no ascendancy over the divine, as in us the passions very often domineer over the reason; but the divine will always exercised its dominion over the human: for the actions of the human were all guided and directed by the power and sway of the divine.

"In accordance with the doctrine of the wonderful union of the divine and human wills that exist in the person of Christ, we concur in the consistency of attributing his operations to a natural and supernatural agency. We do not ascribe his superior actions only to the divinity, unconnected with the humanity; nor his inferior acts only to the humanity, unconnected with the divinity. Were it not truly proper to connect the great with the little, how could it consistently be said that the Son of Man descended from heaven, and that God was crucified and bled on the cross? To the unconfounded union of both the divinity and humanity we attribute the divine and human operations of Christ, who sometimes as a God acted in the superior power of God, and sometimes as a man, acted in the capacity of man, as it is easily demonstrated by the whole course of his dispensations from the beginning to the close of his divine mission. He felt hunger as a man, and fed thousands with a few loaves as a God. He prayed for us and on our behalf as a man, and accepted with his Father the prayers of all his people as a God. In humanity he was brought as a lamb to the slaughter, and was dumb as a sheep before her shearers; but he is the Word of God, by whom the heavens were created, in his divinity. He died in human nature as a man, and raised the dead by divine power as a God. He suffered the pangs of death as a man, and conquered death by death as a God. It was not the one that died, and the other that conquered death; but it was Christ himself, who died, who lives, and who vivifies the dead. For the same Christ, being a man, and of a mortal nature, and being a God, and of an immortal nature, not dividing into two the unconfounded union of the divinity and humanity, so as to render the one untormentable and immortal, and the other susceptible of tortures and death, he suffered on the cross for the salvation of mankind with the inexplicable combination of these contrarieties, yielding in human nature to tortures and death, and in divinity, being free from pain, and immortal. He that died in human nature, was alive in divinity; he that was tortured on the cross, remained also free from the pangs of tortures; he that perspired through fear, levelled on the ground his assailants; he that was unjustly humiliated and strengthened by angels, strengthens all his creatures; he that is Creator of the universe, coequal in divinity with the Father, was born from his creature, and

partook of our nature. He is proclaimed by the preachers of the gospel to be perfect God and man, uniting in his person divinity and humanity in a manner far surpassing the union of the soul and body; for the former, being commended into the hands of the Father, was separated from the latter, but the divinity continued inseparable from both of them*."

The preceding creed is immediately followed by a detailed account of the forms and ceremonies observed in the Armenian Church, similar to that which the writer had previously drawn out at the particular request of Alexius. It is concluded by the following short paragraph:

"In the perusal of our letter, wherein the creed and the observances of our Church are explained in a comprehensive style, we humbly hope that your Gracious and Imperial Majesty will not deny us the candour and sincerity with which our sentiments are embodied in writing. Let us not be suspected of parasitical subterfuges in the communication of our thoughts, and let it be remembered that we have stated in this nothing which is at variance with simple truth, and the genuine effusions of our hearts."

The motives of the writer in making this assertion were to silence the mouths of such miscreants of his nation, as had gone over to the Church of Greece, and were invidiously endeavouring to baffle the consummation of the proposed union, by rendering the doctrines and ceremonies of the Armenian Church censurable in the eyes of the Emperor and Patriarch of Constantinople.

On the return of the embassy to the Court of Greece, the letter of Niersis was put into the hands of the emperor Manuel, who personally presented it to the patriarch. A translation of it being read before a numerous assembly of the dignitaries of the Greek Church, they were struck with admiration at the irresistible arguments which it comprised. They were stimulated by its contents to the abandonment of the inveterate hatred which they bore towards the Armenians, and unanimously agreed in effecting the contemplated union between the two Churches. The emperor, excited by an intense desire of promoting this sacred cause, proposed to pay a visit to Armenia, accompanied by some of the learned theologists of Greece, with a view of meeting Nierses the Graceful, and holding with him a conference on the religious differences that existed between the two nations; but he was unfortunately prevented from the fulfilment of his intention by the

* This clear, lucid and unequivocal confession of faith is enough to carry conviction to the minds of the most fastidious of our accusers, that the Church of Armenia is totally free from the heresies of Eutyches! Let it also satisfy such misinformed, misled, and misguided, writers as Mr. Charles Mac Farlane, author of the *sublime* Tale of Constantinople, entitled "The Armenians," that *we* Armenians are not Eutychians, as he is led to believe from the misrepresentations of the Romanists.

commotions which at that time prevailed in the west. He consequently chose the alternative of deputing in May, A. D. 1170, to Hiromcla, LEZION Master THEORIANEY, a Greek divine, eminently distinguished for his theological and philosophical attainments, with JOHANNES, the learned Abbot of an Armenian monastery, from Philippolis, generally known by the appellation of UTHMAN, bearing an imperial letter addressed to the pontiff of Armenia, in these terms :—

"It afforded us great joy to learn your willingness to effect a happy union between the sister Churches, and acquiescing in your laudable views, we have deputed learned and pious men to confer with you on our behalf, and use every means in their power to remove the wall of partition between us."

On the arrival of the deputation at Hiromcla, THEORIANEY and JOHANNES were kindly received by the Armenian bishops that were assembled by NIERSES the Graceful in the pontifical house, for the purpose of adopting the best mode of carrying the proposed union into execution. NIERSES, on the letter of the emperor being presented to him by THEORIANEY, shewed the latter every mark of honor and kindness, which his rank and the immediate object of his mission required. THEORIANEY had brought with him a copy of the letter of NIERSES, addressed to the emperor, with a view of obtaining an explanation on some points that appeared doubtful to them, and of satisfying their minds as to the reality of some assertions that were made by those who were inimically disposed towards the Armenian Church. To these ends an assembly of the Armenian and Greek bishops was held in Hiromcla, who commenced discussing the important points with decorum, mildness, and moderation. THEORIANEY, in the course of perusing the letter of NIERSES to the assembly, proposed, in proper order, several questions for solution, to which NIERSES made replies, full of convincing proofs. The course of discussions comprised queries on the duality of nature and will in the person of Christ, (about which point great stress was laid on this saying of CYRILLUS : "The incarnate Word is of one nature," which admits of various constructions,) the exact day of the commemoration of the nativity of our Saviour, the propriety of the prayer "Holy God," which was offered in the Armenian Church, the preparation of the holy unction, the necessity of performing prayers within the Church, and the decrees of the council of Chalcedon. At the conclusion of the meeting, NIERSES, in his endeavours to remove an erroneous impression from the mind of THEORIANEY, that the Armenians were monophysites, cited from a work of JOHANNES the philosopher, a renowned pontiff of Armenia, several proofs corroborative of the duality of nature in Christ. "The work in question," said he, "which was before imperfectly known but to a few of our nation, was afterwards unanimously adhered to by my predecessors in the ponti-

ficate of Armenia." The work was, at the desire of THEORIANEY, produced at the meeting, and a few passages of the same being read to him, he highly admired its wholesome doctrine. A transcript of it was accordingly made out at the request of THEORIANEY, who wished to take it to Constantinople for the inspection of the emperor and patriarch. The proceedings of this council were committed to writing by THEORIANEY, as it appears from the panegyric written by NIERSES LAMBRONENSIS on NIERSES the Graceful. THEORIANEY's account of this meeting was, in the year 1578, published in Greek and Latin, in conjunction with the records of the fathers of the Church.

Before the mission had quitted Constantinople for Hiromcla, the emperor MANUEL communicated to MICHAEL, the patriarch of Syria, his intention of acceding to an union of the Greek and Armenian Churches. THEORIANEY, on his arrival at Hiromcla, wrote to MICHAEL, soliciting his presence at the Council of union which was shortly to be held in the pontifical house of Armenia. The latter deputed a proxy in the person of JOHANNES, bishop of Cheson, who, reaching Hiromcla after the meeting had terminated, felt great displeasure at the acquiescence of NIERSES the Graceful in the doctrines of the Greek Church, and began to censure him, as the representative of his patriarch, for such a line of conduct. NIERSES, by sensible observations, convinced him of the propriety and necessity of the union, and desired him that on his return to Syria he should use every means in his power to secure the consent of MICHAEL to the removal of the religious differences which had for ages disturbed the peace of the sister Churches.

On the departure of THEORIANEY for Constantinople in October in the year 1170, NIERSES addressed a letter to the emperor, of which the following is an outline.

"In delivering your Imperial letter to us, THEORIANEY assured us of the love and good-will, which you are graciously pleased to exercise in increasing the spiritual and temporal welfare of our nation. The proposal of effecting this happy union between the two Churches could proceed from no other source, than from a mind gifted with the choicest blessings of heaven, and entirely devoted to the service of its Creator. Enriched with every thing that is great and good, you burn with the desire of becoming a partaker of our spiritual poverty. On a conference held between us and the learned divines, whom your Majesty was pleased to depute, the veil of the unjust aspersions with which the two nations were covered, was rent asunder. By the collision of contrary opinions, the truth, which was surrounded with a mist of falsehood, burst to light, and shone with redoubled splendour. The result of the council of union is conducive to carrying conviction to the mind of every reasonable being, that the Greeks are free from the heresy of the Nestorian* division, and that the

* For the Nestorian heresies, see EUSEBIUS's Ecclesiastical history, tom. iii. pp. 256 and 257.

Armenians are also free from that of the Eutychian* confusion. Concurring in the fundamental principles of religion, the Armenians and Greeks are united together by the grace of God in the similarity of the creed of the Catholic and Apostolic Church. Fixed in the determination of our happy union, I shall address all our bishops residing in different quarters of Armenia, and ask their consent to some important points proposed by you for our acceptance, lest by their being excluded from taking a part in the furtherance of this desirable object, the result of our endeavours may prove contrary to our sanguine expectations. I have also, conformably with the desire of THEORIANEY, furnished him with another letter descriptive of the confession of our Church."

In this letter, after treating of the incarnation of our Saviour, in accordance with the tenor of his former one, he adds, that it is consistent with the orthodox faith to admit duality of nature in Christ, by reason of his perfect divinity and perfect humanity; that the Armenians, by attributing one nature to the incarnate word, on the authority of CYRILLUS, confess an unconfounded and indivisible combination of the divine with the human nature; and that the Church of Armenia anathematizes those who, in the sense of the heretical doctrine of EUTYCHES, may confessedly ascribe one nature to Christ.

On the return of THEORIANEY and JOHANNES UTHMAN to Constantinople, they felt great satisfaction in presenting to the emperor the letter of NIERSES, together with an account of the proceedings of the council. The perusal of these interesting documents afforded the greatest delight to the emperor, the patriarch, and the other dignitaries of the Greek Church. Their joy at the favourable prospect of their undertaking could only be increased by a sense of veneration, with which they were impressed on their being informed by THEORIANEY of the piety, mildness, and pleasant address of NIERSES the Graceful. The fame of the amiable qualities of the pontiff of Armenia rivetted the hearts of the Greeks to the cause of the sacred union, and made them exclaim with admiration, "Behold the wise course pursued by the pontiff of Armenia, and consider the orthodox creed followed by himself and the whole of his congregation! Thanks to Heaven, that in these

* The heresies of EUTYCHES are thus alluded to by EUSEBIUS in his Ecclesiastical History:

Ὡς δ' οὖν κληθεὶς Εὐτυχὴς οὐκ ἐλήλυθε· τὰ δὲ, και παραγενόμενος ἑάλω. εἰρήκει γὰρ, ὁμολογῶ εκ δύο φύσεων γεγενῆσθαι τὸν Κύριον ἡμων πρό τῆς ἑνώσεως· μετὰ δὲ τὴν ἕνωσιν, μίαν φύσιν ὁμολογῶ. ὃς οὐδὲ τὸ σῶμα τοῦ Κυρίου ὁμοούσιον ἡμῖν ἔλεγεν εἶναι· καθαιρεῖται μεν.

EUTYCHES igitur, cum ad synodum vocatus non venisset, ac deinde coram convictus esset hæc dixisse: Fateor Dominum nostrum Jesum Christum, ante unitionem quidem duas habuisse naturas: Post unitionem vero unam duntaxat naturam confiteor. Sed et corpus Domini negabat ejusdem esse substantiæ cujus sunt nostra: depositus est.—*Eusebii Ecclesiast. Histor. tom.* iii. *p.* 261.

days of degeneracy we see a pastor of the Church adorned with so many Christian and moral virtues!" The hatred which the Greeks manifested towards the Armenians gradually began to abate, and a sort of generous sympathy was felt by the former, for the lamentable degradation to which the latter were reduced in a political point of view. They could not, however, reconcile themselves to the idea, that the Armenians, after conforming to the fundamental principles of orthodox faith, and admitting duality of nature in our Saviour, should still persist in asserting one nature in the union of his divinity and humanity. Though the arguments, with which the Armenians endeavoured to clear their minds on this subject, were perfectly sound and correct, yet the Greeks could not overcome their reluctance to make such concessions to them, and were consequently anxious that this obstacle to their union, together with a few others of minor importance, originating from certain observances of the Armenian Church, might prudently and speedily be removed.

Hereupon the emperor came to the determination of sending another embassy to Hiromcla, consisting of the abovementioned Theorianey and Johannes Uthman, who were furnished with letters from the emperor and patriarch Michael, bearing date December, 1172, and instructed to urge Nierses to apply himself with increased interest and assiduity to the fulfilment of the object in view, lest the death of either of them might put a stop to the successful termination of their undertaking. Nine points connected with the creed of the Church of Greece were distinctly stated in the imperial letter, for the consideration and subsequent acceptance of the Armenians. It was also proposed by the emperor, that those points, but particularly that of the duality of nature in Christ, should be discussed, and admitted by the Armenians in a general council to be held for that purpose. Should they, however, be reluctant in conceding to some of the points alluded to, they might communicate their objections in a letter addressed by their pontiff to the emperor. The proposed points are the following:

I. Anathematize those who admitted one nature in Christ, that is to say, Eutyches, Deoscorus, Severius, Timotheus, and the followers of their heresies.

II. Confess in our Lord Jesus Christ, one Son, one person, one hypostasis formed of two perfect natures, which are inseparable, indivisible, unchangeable, unalterable, unconfounded; so as not to consider Christ in a separate sense the Son of God and the Son of the holy Deiparous, but to acknowledge in him unconfusedly the Son of God and the Son of Man, and to confess him to be both God and Man in the duality of his nature. Confess in him the duality of actions and

natural will, both divine and human, not resisting each other, but the human will following and obeying the divine. III. The prayer "Holy God" should be offered in your Church by the omission of "*who wast crucified for us,*" and the conjunction "*and.*" IV. You should conform to the Church of Greece in commemorating the feasts, that is to say, the Annunciation day, on the 25th of March; the Nativity, on the 25th of December; the Circumcision, on the eighth day after the birth of Christ, to wit, on the 1st of January; the Baptism on the 6th of January; the Presentation of our Saviour to the temple on the fortieth day after his birth on the 2nd of February, and in like manner, agreeing with us in observing all the dominical feasts, as well as those of the holy Virgin MARY, of St. JOHN, of the Apostles and of others. V. The preparation of the unction should be made of the oil of the fruit of trees. VI. The Communion Service should be performed with leavened bread, and wine mixed with water. VII. Let Armenian Christians, both clergy and laity, remain within the Church, during the hours of prayer and the performance of communion service, with the exception of public penitents, who are prohibited by ecclesiastical canons from staying in the midst of the Church during the time. VIII. You should accept the fourth, fifth, sixth, and seventh general assemblies. IX. The choice of the nomination of your pontiff should be vested only in the emperor of the Greeks.

On the arrival of the embassy at Hiromcla, THEORIANEY and JOHANNES UTHMAN met with a very kind reception from NIERSES the Graceful, who having respectfully received the letters of the emperor and patriarch of Constantinople, communicated the contents of them to the principal bishops and friars of the Armenian Church, who had repaired to Hiromcla from the mountains of Taurus and the frontiers of Mesopotamia. Though they were easily persuaded to concede to the chief points proposed by the Greeks, yet great difficulty existed in obtaining the consent thereto of other Armenian bishops, whose number amounted to upwards of three hundred, and who were living in different distant quarters, especially in the frontiers of Armenia major, save the body of monks who resided in monasteries, and who were almost of an equal number. Consequently, NIERSES thought it necessary to summon these worthies to the general meeting which was shortly to be convened for taking into consideration the points proposed by the authorities of Greece, and communicating the result of the assembly in a suitable letter to the emperor. He conceived the unanimous voice of all the principal dignitaries of the Church of Armenia indispensably necessary in the adoption of the points, which were the connecting links of the sister Churches, lest, he

feared, an unfortunate division might be created amongst the Armenian ecclesiastics, and the result of their undertaking be attended with lamentable detriment.

The ambassadors of the court of Constantinople applauded the wise precautions which marked every act of the pontiff of Armenia, but seeing that the council could not possibly be held before the setting in of the summer, they determined to depart from Hiromcla. NIERSES, in conjunction with THEORIANEY, addressed letters to MICHAEL, the patriarch of the Syrian Church, communicating to him the points which were proposed by the Greeks for their acceptance, and soliciting the favour of his presence in the council that was shortly to be held at Hiromcla for that purpose. MICHAEL being prevented by his various avocations from going to Hiromcla, sent in his room the friar THEODORUS, who was eminently distinguished for his profound learning and conversancy with the Syrian, Greek, Armenian, and Turkish languages. On the arrival of the latter at Hiromcla,he was received by NIERSES with every kind of respect due to his rank.A discussion arose between them on the import of the words "substance" and "nature," which, according to the doctrine of *Aristotle*, admitted of various constructions. THEODORUS, widely differing from the sentiments expressed by NIERSES on this subject, immediately took his departure from Hiromcla. In the mean while, THEORIANEY and JOHANNES UTHMAN returned to Constantinople, furnished with letters addressed by NIERSES to the emperor MANUEL and the patriarch MICHAEL. NIERSES promised them to convene a general council for the decision of the question of the intended union, and to endeavour to make the concessions they required. "I shall assiduously try," says he, "to overcome the long received customs of my countrymen, which prevail on them with the power of a second nature, and to force them to an acquiescence in such of the points proposed in your letters, as may possibly be reconciled to their minds. In so doing, we shall only be actuated by a desire of promoting divine love and peace amongst us, but not by an idea of turning from errors into truth. The acceptance of the rest of the points either must be overlooked by you, or left to time, and the happy union which shall shortly be effected amongst us."

Immediately after this,NIERSES addressed letters to all the Armenian bishops, abbots, and friars residing in different quarters of Armenia, Syria, Aluans, Georgia and Persia, communicating to them all that had passed respecting the union of the sister Churches. He also desired them to pray to the Almighty for the consummation of the laudable object in view, and to take an early opportunity of going to Hiromcla for the purpose of being present in the council that was

shortly to be convened. Moreover he deputed one friar STEPHEN with a letter, inviting the Armenian clergy of Ani and Haghbat to the proposed assembly.

But alas! how often human endeavours and expectations are frustrated before they have attained to maturity! On the lapse of a few months, while NIERSES was engaged in preparations for holding the council of union, his earthly career was by the inscrutable dispensation of God terminated, *Anno Domini* 1173, in the seventy-third year of his age. He enjoyed the supreme dignity of a pontiff for seven years, and in that period ordained only seven bishops. His remains lay in state for several days, during which time numbers of Armenians thronged to the pontifical house with a desire of kissing the hand of the deceased. Among those who had assembled there to pay their last tribute of veneration to the virtues of the deceased pontiff of Armenia, were NIERSES LAMBRONENSIS and several bishops and friars of distinction.

This melancholy event plunged the nation into the greatest distress, for they had lost in NIERSES the Graceful a vigilant pastor, a kind father, a faithful friend, a gifted divine, and a most zealous advocate of the truth of Christianity. GREGORY BASIL, the nephew of the deceased pontiff, who was living at a great distance from Hiromcla, on hearing of the dangerous illness of the latter, immediately repaired thither to see his uncle ere he breathed his last. On his arrival at that place, he found NIERSES dead. He evinced the greatest sorrow at the lamentable catastrophe which had fallen on his family and the nation in general. The funeral of the deceased pontiff was performed with the greatest pomp and honors, that his rank and exalted station deserved, being attended by almost all the dignitaries of the Armenian Church, the nobility and other distinguished members of the nation, whose heartfelt sorrow, at the irreparable loss which the Church and the state had sustained, could distinctly be read in the melancholy expressions of their downcast countenances. His remains were deposited in a sepulchre which was dug near that of his brother GREGORY, and a very splendid mausoleum was afterwards raised over him, bearing upon it a suitable inscription commemorative of his moral and Christian virtues.

News of this melancholy event reaching Constantinople, filled the heart of the emperor with the most poignant grief, and spread general regret throughout the Greek empire, every Greek sympathising with the Armenians for the loss which they had sustained in the person of their gifted pontiff. When his grief had comparatively subsided, the emperor wrote a letter of condolence to GREGORY BASIL, who had by

the unanimous voice of the nation succeeded his uncle in the government of the Church of Armenia. The progress of the religious union of the two nations, which was unfortunately impeded by the Church of Armenia's being deprived of its head, was renewed by the communications of the emperor with the pontiff GREGORY, who, emulating the laudable example of his immediate predecessor, manifested equal zeal and inclination in the restoration of peace to the bosom of the Church of Christ. Before, however, the question of the long wished-for union was happily decided, Greece was deprived of her most illustrious, pious, and virtuous ruler, in the year of our Lord 1180, which melancholy catastrophe proved a death-blow to the nearly-finished structure of peace, and blasted in the bosoms of every Armenian and Greek the hopes of their future union!

II.—*Discovery of Buddhist Images with Deva-nágarí Inscriptions at Tagoung, the Ancient Capital of the Burmese Empire. By Colonel* H. BURNEY, *Resident at Ava.*

[Read before the Society, 6th April, 1836.]

I have the pleaure to forward to you a couple of images of GAUDAMA in *Terracotta*, which Captain HANNAY has just sent down to me from *Tagoung*. On both there is an inscription, apparently in the same old Deva-nágarí character, as in the inscription No. 2, of the Allahabad column, and probably consisting of the same words as those on the image of Buddha found in Tirhut, and in the other ancient inscriptions described in No. 39 of the Journal of the Asiatic Society*.

Tagoung, written *Takoung*, (or according to Sir W. JONES's system, *Takaung*, but pronounced by the Burmese *Tagoung*,) you will find placed in our maps a little above the 23rd degree of north latitude, and on the eastern or left bank of the *Erawadi* river. Captain HANNAY, however, has ascertained its latitude by an observation of the sun to be 23° 30′ N., and several Burmese itineraries in my possession make its distance from Ava 52 *taings*, or about 100 miles. The Burmese consider *Tagoung* to have been the original seat of their empire, and the site of an ancient city, which was founded before the time of GAUDAMA, by a colony that emigrated from Central India. Some faint remains of an old city are still to be seen on this spot, where among the ruins of some pagodas, Captain HANNAY found the images I now send you. No one here can decypher the character of the inscriptions, but on showing to some of the learned, the account

* This is precisely the case :—even to the form of the letters—the dialect however seems to be *Magadhí* or *Páli*, *dhammá* and *pabhavá* for *dharmá* and *prabhavá*, &c. See the accompanying plate.—ED.

of the *Bauddha* inscriptions given in the 39th No. of the Journal of the Asiatic Society, the words "*Ye dhamma*, &c." were immediately recognised, and supposed to be those placed under these images of GAUDAMA also. The two figures seen standing on each side of GAUDAMA in one of these are not, as I had supposed, his two favorite disciples, MOUGGALAN and THÁREPOUTTARA, but figures of a preceding *Buddha* named DI'PENKARA, who first delivered the prophetical annunciation to GAUDAMA, whilst the latter was existing in the state of THOOMEDA hermit, declaring that after myriads of years, which he would take in perfecting himself in every virtue, he would attain the state of a *Buddha*. The learned Burmese confirm Dr. MILLS's opinion, and Mr. HODGSON's information, that there is no connexion between the last two lines and the first two produced by M. CSOMA DE KÖRÖS, in the 39th No. of the Journal of the Asiatic Society. The last two, they say, are intended to show the points of instruction delivered, not by GAUDAMA only, but by every preceding *Buddha*, and they translate the *Pálí* thus:

"The not doing of every kind of evil, fulfilling of good, and purifying and cleansing the heart: these above mentioned are the precepts of *Buddhas*."

With the first two lines beginning "*Ye dhamma*," the Burmese books connect the following anecdote:

On the third year after GAUDAMA had attained the state of a *Buddha*, whilst he was residing at Welawoon monastery in the city of *Yazagyo*, *(Rajgiri,)* one of his disciples, named ASHEN ATHAZI MATT'HEE, went into that city to receive charitable donations, and was met by OOPADEITTHA, the son of the female Brahman THÁRE, and a disciple of THEIN-ZEN PARABAIK, some kind of heretics so called. OOPADEITTHA asked ASHEN ATHAZI MATT'HEE, who was his teacher, what were his opinions; the latter replied, "My teacher is the most excellent Lord GAUDAMA, his doctrines are as boundless as the sky. I am but lately become a *Yahan*, and know a little of them only." OOPADEITTHA begged that he would repeat a little of them only, when ATHAZI MATT'HEE recited the two lines beginning with the words *Ye dhamma;* but the moment he finished the first line, OOPADEITTHA was converted. He then followed the other to GAUDAMA, who received him as a disciple, and changed his name into THÁREPOUTTARA, or the son of THÁRE the female Brahman, by which name he was ever after distinguished as one of the favorite disciples of GAUDAMA, and is always figured as seated on his right hand, whilst MOUGGALAN, the other favorite disciple, is seen on the left hand. Hence, these words have ever since been considered, as Mr. HODGSON states, as a *confessio fidei*

among *Buddhists*. Before giving the Burmese explanation of these two lines, I must premise, that according to their system of belief, there are four *Theettsa*, fundamental truths, or moral laws in the universe, a knowledge of which GAUDAMA attained intuitively at day-break of the morning on which he was perfected into a *Buddha* under the pipal-tree at *Gaya*, and therefore, one of his titles is *Thamma tham-bouddhattha*, said to mean, he who intuitively acquired a knowledge of the four *Theettsa*. These four *Theettsa* are called *Doukkha Theettsa, Thamoudaya Theettsa, Niraudha Theettsa, and Megga Theettsa.*

1. *Doukkha Theettsa* means the law of suffering and being, to which all sentient beings are certainly subject whilst revolving, according to the destiny of their good or evil conduct, in the three different states of existence, whether as a *Nat* or inferior celestial being, a man, or a brute.

2. *Thamoudaya Theettsa* is the law of evil desires and passions, by which all sentient beings are certainly affected.

3. *Niraudha Theettsa* is the termination of or emancipation from the operation of the two preceding laws. Not being subject to age, sickness, death, or misery, and being in a state of ease, quiescence and duration uninterrupted. This is *Neibban*.

4. *Megga Theettsa* is the cause or the way of reaching the last, and is explained by some to be the *Meggen Sheet ba*, or the eight good ways, which, as translated by Mr. JUDSON, are right opinion, right intention, right words, right actions, right way of supporting life, rightly directed intelligence, caution, and serenity. Others explain it to be the *Meg le dan*, four grand ways, or four grand orders of *Ariya*, each subdivided into two classes, and an *Ariya* is a man who has extinguished evil desires and passions, and attained proficiency in certain virtues and miraculous powers.

Now the Burmese say, that GAUDAMA's doctrine shows, that the first of the above *Theettsas* is the effect, and the second the cause, and that the third only can emancipate us from the eternal thraldom and suffering of the two first, and that this third is to be obtained only by means of the fourth. The lines are thus literally translated:

"The law (of suffering and being) proceeds from a cause, which cause (the law of evil desires and passions) the *Tathagata* preaches, and *Niraudha*, the means of overcoming or terminating those (two laws). These are the opinions of *Maha Thamana*, or the great *Yahan*.

Dhamma, according to the Burmese, is not "human actions," or "all sentient existences" only, but the law which governs or affects them, the fundamental law of the moral world.

All that the Burmese know of the emigration from Central India,

and of the founding and history of the old city of *Tagoung*, is given in the 3rd volume of the Chronicles of the Kings of Ava. Here is an abstract of the tale.

Long before the appearance of GAUDAMA, a King of *Kauthala** and *Pínjalarít*, desiring to be connected by marriage with the King of *Kauliya*, sent to demand a daughter, but receiving a refusal on the ground of his being of an inferior race, he declared war and destroyed the three cities of *Kauliya*, *Dewadaha*, and *Kappílawot*, which were governed by the *Tháki* race of kings†. These cities were afterwards restored, and the *Tháki* line re-established; but on the occasion of the above disaster, one of the *Tháki* race of kings, ABHI'RÁJA, the king of *Kappílawot*, retired with his troops and followers from Central India, and came and built *Tagoung*, which was then also styled *Thengat tha ratha* and *Thengat tha nago*. Here had stood a city in the times of the three preceding *Buddhas*. In the time of KEKKUTHAN it was called *Thanthaya púra*; in that of GOUNÁGOUN, *Ratha púra*, and in that of KATTHABA, *Thendwè*. On the death of king ABHI'RÁJÁ, his two sons, KAN YÁZÁ GYEE and KAN YÁZA NGAY, disputed the throne, but agreed by the advice of their respective officers to let the question be decided in this way, that each should construct a large building on the same night, and he, whose building should be found completed by the morning, should take the throne. The younger brother used planks and bamboos only, and covered the whole with cloth, to which by a coat of white-wash he gave the appearance of a finished building. At dawn of day, KAN YÁZA' GYEE, the elder brother, seeing the other's being completed, collected his troops and followers, and came down the *Erawadi*. He then ascended the *Khyendwen*, and established himself for six months at *Kule*‡ *Toungnyo*, calling it *Yázágyo*, and sent his son MOODOOTSEITTA to be king over the *Thoonaparan Pyoos*, *Kanyan*, and *Thet*, who then occupied the territory between *Pegu*, *Arracan*, and *Pagan*, and had applied to him for a prince. KAN YA'Z'A-GYEE then built the city *Kyouk padoung* to the east of the *Guttshapa nadee*, and resided there for 24 years. From thence he went and took possession of the city of *Diniawadee*, or *Arracan*, which had originally been founded by a king MAYAYOO, and having constructed fortifications, a palace, &c. took up his residence there.

* *Kauthala*, (Kosala) Dr. WILSON considers to be the same as the present territory of Oude. Some of the Burmese consider *Pinjalarít* to have been a kingdom in the Punjab.

† See No. 20 of the Journal of the Asiatic Society for an account of the origin of the *Shákya* race, which the Burmese call *Tháki* and *Thakya Thaki*.

‡ *Kule* is a territory to the southward of Manipur.

The younger brother, KAN YAZA NGAY, took possession of his father's throne at *Tagoung*, where the undermentioned 33 kings reigned in succession.

1. Abheerája.
2. His son Kan Yázá ngay.
3. His son Zaboodeepa Yázá.
4. His son Thengatha Yázá.
5. His son Weippana Yázá.
6. His son Dewata Yázá.
7. His son Munika Yázá.
8. His paternal uncle Nága Yázá.
9. His younger brother Einda Yázá.
10. His son Thamoodi Yázá.
11. His son Dewa Yázá.
12. His son Maheinda Yázá.
13. His son Wimala Yázá.
14. His son Thihanú Yázá.
15. His son Dengana Yázá.
16. His son Kantha Yázá.
17. His son Kaleinga Yázá.
18. His son Thendwè Yázá.
19. His son Thíhala Yázá.
20. His younger brother Han-tha Yázá.
21. His son Wara Yázá.
22. His son Aloung Yázá.
23. His son Kaulaka Yázá.
24. His son Thuriya Yázá.
25. His son Then-gyí Yázá.
26. His son *Taing-gyít* Yázá.
27. His son Madu Yázá.
28. His son Menlha-gyí Yázá.
29. His son Than thu thiha Yázá.
30. His son Danenga Yázá.
31. His son Heinda Yázá.
32. His son Mauriya Yázá.
33. His son Bheinnaka Yázá*.

In the reign of the last-mentioned king, BHEINNAKA YÁZÁ, the Chinese and Tartars from the country of *Tsein*, in the empire of *Gandalareet*, attacked and destroyed *Tagoung*. That king, collecting as many of his people as he could, retired up the *Malí* river, where upon his death his followers were divided into three portions. One portion proceeded to the eastward and established the 19 *Shan* states, whence they are called king BHEINNAKA's race. Another portion came down the *Erawadi*, and joined the *Thunaparanta* kingdom, which was inhabited by the *Kanyan* and *Thet* people, and was the seat of MU'DUTSEITTA and other kings of the *Thákí* race. A third portion remained near the *Malí* river, with the last king's principal wife named NÁGA ZEIN. About this period, GAUDAMA appeared in Central India, and a dispute occurred between king PATHANADI' KAUTHALA of *Thawotthi*† and a king of *Kappílawot*, named MAHA NAMA. The former had applied for a daughter in marriage, and the latter, unwilling to deteriorate his race, sent, instead of one of the princesses of royal blood, a daughter named WATHABA KHETTIYA, whom he had by a slave girl. She was however received as a queen, and bore a son, who was named prince WIT'HAT'HOOPA. When this prince grew up, he paid a visit to *Kappílawot*, and on his departure, the spot which he had occupied was termed the place of a slave-girl's son, and washed with milk. Hearing this, the prince vowed revenge, and

* The title of these kings is Rája, but the Burmese pronounce it Yázá.

† *Sravasti* in Oude, according to Dr. WILSON.

declared that as soon as he became king, he would wash the necks of the *Kappílawot* people with blood. Accordingly, on his accession to the throne, he set out three times with an army to attack the *Thakí* race of kings, but was stopped by GAUDAMA. On the fourth time, GAUDAMA, foreseeing the future destiny of those kings, would not interfere, and king WIT'HAT'HOOPA destroyed *Kappílawot*, *Dewadaha*, and *Kauliya*, three cities in the empire or country of *Thekka*, the seats of the *Thakí* race of kings.

On this occasion one of the *Thakí* race, named DAZA YÁZÁ, retiring from Central India, came first and established himself at *Mauroya*, which now goes by the name of *Mweyen*. Thence he proceeded and founded the city of *Thendwè;* and changing his residence once again, he came to *Malí*, and met with the before mentioned queen NÁGA ZEIN, the widow of king BHEINNAKA. Finding her to be of the same *Thakí* race as himself, he married her, and founded the city of Upper *Pagan*. He next rebuilt the ancient city of *Tagoung*, calling it *Pínjalarít*, and *Pínja Tagoung*, or the fifth *Tagoung*, and finally established himself there, assuming the title of THADO ZABOODIPA DAZA YÁZÁ, dividing his followers into classes, organizing an army, and granting titles and honors. The undermentioned line of kings reigned in succession over this new *Tagoung*.

1. Thado Zabudipa Daza Yázá.
2. Thado Taing ya Yázá.
3. Thado Yat'ha ya.
4. Thado Tagwon ya.
5. Thado Lhan byan ya.
6. Thado Shwe ——.
7. Thado Galoun ya.
8. Thado Naga ya.
9. Thado Naga Naing.
10. Thado ya Haula.
11. Thado Poung shí.
12. Thado Kyouk shí.
13. Thado Tshen louk.
14. Thado Tshen dein.
15. Thado taing gyít.
16. Thado Men gyí.
17. Thado Mahá Yázá.

None of these kings reigned long, the country having been much molested by evil spirits, monsters and serpents. The last mentioned king having no son by his principal queen KEINNARI-DEWI, made her brother KHEBADUTA the heir apparent or Crown Prince. At this time the people of *Diniawadi* came to the spot inhabited by the *Pyús*, and attacked and carried off king TAMBULA, who was of the *Thakí* race, and lineally descended from king MUDUTSEITTA, the son of KAN YAZAGYEE. His queen, NAN KHAN, retired with as many followers as she could to the lake of *Thakya*.

In the 40th year, after GAUDAMA's death, whilst THADO MAHÁ YÁZA' the 17th king of *Tagoung* was reigning, an immense wild boar appeared, and committed great destruction in his country. The Crown Prince went forth against the animal, and pursued it for several days,

until he overtook and killed it near Prome; and then finding himself so far from home, he determined on remaining where he was as a hermit. Here he was joined by two of his nephews, named Maha Thambawa and Tsula Thambawa, twins borne by his sister the queen of *Tagoung*, but being blind, the father had insisted upon their being put to death. The mother, after secreting them for some time, placed them at last on a raft, and set them afloat on the *Erawadi*. The Royal Chronicles give an interesting account of the voyage of the two Princes, who are cured of their blindness by a monster at *Tsagain**, and who at length reach the country near *Prome*, and are recognized and received by their uncle. The *Kanyan* and *Pyús* had quarrelled after the people of Arracan had carried off their king, but the former, being victorious, settled themselves near *Prome* under their queen Nan Khan, whilst the *Kanyans* retired, and established themselves at *Sandoway* and on the borders of *Arracan*. Through the recommendation of the hermit Prince of *Tagoung*, the queen Nan Khan married one of his nephews Maha Thambawa, who became king of the *Pyús*, and established the Prome or *Thare Khettara* empire, 60 years after Gaudama's death, 484 B. C.

After the destruction of the Prome Empire, a king Thamauddarit, nephew of the last king of Prome, founded *Pagán;* but the country being much molested by certain wild animals, a young man named Tsaudi' destroyed them, and the king gave him his daughter in marriage, and appointed him his successor. He declined the throne however in the first instance, and placed his old teacher Yat'thegyáung upon it; and on the death of the latter, the young man ascended the throne of *Pagán* in the *Pagán* era 89, A. D. 167, with the title of Pyu' tsaudi'. But this Pyu' tsaudi', or third king of *Pagán* also is said to have been of the *Tagoung* royal race, and a *Thákí* Prince. His father, Thado Adaittsa Yázá, was lineally descended from the 17th king of *Tagoung*, Thado Maha Ya'za', but during his reign *Tagoung* having again been destroyed by evil spirits and monsters, as well as by the Chinese and Tartars, he had quitted the country, and settled with his family in a private capacity at *Malí*, supporting himself as a gardener. After receiving a suitable education, the son Pyu' Tsaudi came down to *Pagán*, in order to seek his fortune, and then distinguished himself by killing the wild animals as before-mentioned.

No further mention of *Tagoung* can I find in the Royal Chronicles, until we come to the 6th vol., in which, after being told that a daughter of Athenkhaya, the founder of *Tsagain*, was married to Thado tshen-dein, of the *Tagoung* royal race, and had a son named Yahu'la,

* City directly opposite *Ava*.

who was seven years of age, when king THEEHAPADE *alias* MEN-BYOUK ascended the *Tsagain* throne, and to whom at the age of 16 that king had granted the city of *Tagoung* as a *jaghir*, together with the title of THADO MEN-BYA. We are informed, that in the Burmese year 725, A. D. 1363, when the Shan chief THO KHYEEN BWA came down from *Mogoung* and *Monhyeen* to attack *Tsagain*, his army was first stopped at *Tagoung* by THADO MEN-BYA, but that the Shans soon took that city, and completely destroyed it, its governor flying to *Tsagain* with a single elephant. This governor, THADO MEN-BYA, afterwards took possession of the *Tsagain* and *Penya* kingdoms, and in the Burmese year 726, A. D. 1364, founded the city of *Ava*, and the line of the kings of *Ava*.

Tagoung, after the Shans destroyed it, does not appear to have been restored, and it is now but a village with a few ruins. The district of *Tagoung* is the *jaghir* of the late Wungyee of *Rangoon's* daughter, who is one of the inferior queens, styled *Tagoung Men-thamí*, princess of *Tagoung*. THADO was a title peculiar to the *Tagoung* royal race. It is remarkable, that some of the names in the two lists of the kings of *Tagoung* correspond. The Burmese chronicles give no details of the reign of any of these kings, excepting of the first in each list, and of the last in the second list. One old work, *Zabudipa kwon-gya*, takes notice only of the second list of sovereigns; and states that DAZA YAZA retired from Central India, and came to *Tagoung*, about 300 years before the appearance of GAUDAMA. As the last mentioned, or 17th king, MAHÁ YÁZÁ, is also stated to have ascended the throne 20 years after GAUDAMA's death: this would allow a duration of about 18 or 20 years to the reign of each of the king's preceding, corresponding with the average of king's reigns as fixed by Sir ISAAC NEWTON. The great point with the Burmese historians is to show that their sovereigns are lineally descended from the *Thakí* race of kings, and are "Children of the Sun*;" and for this purpose, the genealogy of even ALOMPRA, the founder of the present dynasty, is ingeniously traced up to the kings of *Pagán*, *Prome*, and *Tagoung*. The countenances of the figures in the accompanying images are very different from those you see in all modern Burmese mages†.

* One of the king of *Ava's* titles is *Ne dwet bhuyen*, Sun-descended Monarch.

† They are very nearly of the same character as those found at Sárnáth, and may have been made there or at *Gaya* for exportation, as is the custom to the present time.—ED.

III.—*On the preparation of Opium for the China market: written in March* 1835, *and then communicated to the Benares and Behár Agencies. By* D. Butter, *M. D. Surgeon* 63*rd B. N. I. late opium examiner of the Benares Agency.*

1. In committing to paper, for the use of my successor in office, the following observations, I would beg, once for all, to disclaim the idea of their being infallibly correct: for, although they are the result of ten years' attention to their various subjects, I am aware of the disadvantages under which an individual labours, upon whom falls the task of first writing upon any subject involving the discussion of obscure questions, and who is thus deprived of the benefit of the judgment of other persons; and am prepared to find my remarks hereafter greatly modified by the progress of discovery.

2. The great object of the Bengal Opium Agencies is to furnish an article suitable to the peculiar tastes of the population of China, who value any sample of opium in direct proportion to the quantity of hot-drawn watery extract obtainable from it, and to the purity and strength of the flavour of that extract when dried and smoked through a pipe. The aim, therefore, of the agencies should be to prepare their opium so that it may retain as much as possible its native sensible qualities, and its solubility in hot-water. Upon these points depend the virtually higher price that Benares opium brings in the China market, and the lower prices of Behar, Malwa, and Turkey opium. Of the last of these, equal (Chinese) values contain larger quantities of the narcotic principles of opium; but are, from their greater spissitude, and the less careful preparation of the Behar and Malwa, incapable of yielding extract in equal quantity and perfection of flavour with the Benares.

3. It therefore becomes a question, how the whole process of the production of opium, from the sowing of the seed to the packing of the chests for sale, should be conducted so as to preserve with the least injury its native flavour and its solubility.

4. There can be no doubt that the quantity and richness of the milk obtained from each poppy-head depend greatly upon the geological and other physical conditions of the locality which produces it; especially the soil, sub-soil, manuring, and irrigation; and also upon the seed which is employed. But as these matters are, in the present circumstances of the Bengal agencies, little open to choice or control, the first *practical* enquiries which claim our attention relate to the extraction of the juice and its treatment while in the hands of the *koerís*.

5. Of the various processes for the preparation of sugar and medicinal extracts from vegetable juices, it is well known that distillation in

vacuo is incomparably the most efficient in preserving unaltered the original taste of the sugar, and the taste, solubility, and therapeutic powers of the extracts. It is also known that this process owes its superiority to the exclusion of the chemical as well as the physical agency of the atmosphere, to its rapidity of exsiccation, and to the comparative lowness of temperature at which it is performed. When sugar-cane juice, after even half an hour's exposure to the air, is boiled in a narrow deep vessel, and under the pressure of the atmosphere, vaporisation goes on so slowly that the sugar has time to undergo the vinous and acetous fermentations, whereby a certain portion of it is converted into vinegar, before the heat can be raised high enough to check this change; and the high temperature, to which it is so long exposed during this slow vaporisation, chars another portion, and converts it into molasses. Other vegetable juices, under similar circumstances, undergo analogous transformations: much of their substance is converted into vinegar; and the high temperature causes a partial decomposition of the rest: oxygen also is largely absorbed from the atmosphere, and greatly impairs the solubility of the dried extract.

6. On the principles which flow from these facts, it would be, *chemically* speaking, advisable to prepare opium by distilling in vacuo, large quantities of the milk just as it has oozed from the capsules; and I have no doubt that opium thus prepared would possess in an unprecedented degree the desired qualities of solubility and strength, and purity of flavour, as well as narcotic power; and can imagine, that under a system of open trade in opium, this process would be *commercially* profitable. It would, however, be inapplicable under a monopoly constituted as the present system is; and I have mentioned it only with the view of pointing it out as the acme of that perfection in the preparation of vegetable juices to which we can, with our present means, only approximate.

7. That the approximation may proceed as far as possible, it will be necessary, first, that the poppy juice shall at the time of collection, contain a minimum of water; so that its reduction to the proposed degree of spissitude may be effected in the shortest time, and be therefore attended with the least exposure to the air at a high temperature, and with the smallest consequent loss of solubility and of specific qualities that may be practicable.

8. The goodness of the soil, and the management of the irrigation, are circumstances which powerfully affect the strength of the juice at the time of its collection: but a third agent, still less amenable than these to control, now comes into play, the precipitation of *dew* on the

surface of the capsule. When a current of wind, or a cloudy sky, prevents the formation of dew, it is found that the scarifications made in the capsule about the middle of the preceding day are sealed up by the slight oozing of juice, which had immediately followed the incisions; and the quantity of opium obtained is small. When, again, the dew is abundant, it washes open the wounds in the capsule, and thus facilitates the flow of the milk, which in *heavy* dews is apt to drop off the capsule entirely, and be wasted. But when the dew is in moderate quantity, it allows the milk to thicken by evaporation, and to collect in irregular tiers, (averaging one grain of solid opium from each quadruple incision,) which on examination will be found to have a greater consistency, and a "rose-red" *(Werner)* colour towards the external surface, while the interior is semi-fluid, and of a "reddish-white" colour. This inequality of consistence constitutes the *grain of raw opium*, of which I shall have to speak hereafter.

9. In the collection of these drops of half-dried juice, it is very apt to get mixed with the dew, which, in the earlier hours of collection, continue to besprinkle the capsules, and which here does a double mischief—first, by retarding the inspissation of the general mass of the juice; and, secondly, by separating its two most remarkable constituent parts—that which is soluble, and that which is insoluble in water. So little aware, or so reckless, even under the most favourable construction of their conduct, are the *koéris* of the injury thus caused by the dew, that many of them are in the habit of occasionally washing their scrapers with water, and of adding the washings to the collection of the morning: in Malwa, *oil* is used for this purpose, to the irremediable injury of the flavour of the opium. On examining the juice thus mixed with water, it will be found that it has separated, as above-mentioned, into two portions, a fluid and a more consistent; the latter containing the most of the resin, gluten, caoutchouc and other less soluble constituents of opium, with part of the super-meconiate of morphia; and the former containing the gum, some resin, and much of the super-meconiate of morphia, and much of the colouring principle, which, though pale at first, is rapidly affected by light, and acquires a very deep "reddish or blackish brown" colour. Many *koéris* are in the habit of draining off this fluid portion into a separate vessel, and of bringing it under the name of *paséwá*, for sale, at half the price of opium, to the Benares agency, where it is used as *léwa*, (paste for the petal envelopes of the cakes.) Others, after allowing the soluble principles to become thus changed into an acescent, blackened, sluggish fluid, mix it up with the more consistent part of their opium, and bring the whole for sale in this mixed state;

the consequence of which is that they are subjected to a penalty, called *battá upon paséwá*, and regulated by the estimate of the opium examiner, of the quantity of *paséwá* contained. This penalty is the only efficient check upon this most pernicious practice of the *koéris:* for on the generality of the gomáshtas, it is difficult to impress the necessity of their looking after the *koéris* during the collecting season. Were gomáshtas in general fit for their offices, the name of *peséwá* might be banished from the Bengal agencies; all that is required for that purpose being that they should instruct all their *mahtás* and *koéris*, to exclude dew as much as possible from the opium at collection—never to add water to their opium, then or at any other period; but at the end of their day's collection, to rub it together in a mortar or similar vessel, breaking down the *grain* of it above-mentioned, so as reduce the whole to a homogeneous semi-fluid mass, which should be dried as quickly as possible in the shade, in a current of air free from dust, by spreading it on any clean flat surface, and turning it over ten or twenty times. With this management, one afternoon in the dry collecting season would suffice for bringing to the spissitude of 70 per cent. the collection of each day, which could then be secured, along with the rest of the *koéris'* opium, in a vessel of *any* form, safe from deterioration by internal change. It is a common belief, that all new opium *must* ferment*: but that is a fallacy occasioned by the low degree of spissitude at which opium is generally received at the Bengal agencies, and by the consequent fermentation and swelling up which almost constantly occur, when such opium is allowed to stand for some hours in large vessels.

10. So very large was formerly the admixture of *paséwá* in the opium brought to the Benares agency, that it was thought necessary, for the sake of its appearance, to draw off as much as possible of the black fluid, by storing it, for weeks, in earthen vessels, perforated with a hole. Of late years, there has been a great amendment in this respect, and the draining system has therefore become unnecessary; an event which ought to be followed by the abolition of the inconvenient receptacles in which it was carried on, and by the general substitution of movable wooden cases and drawers in their stead.

11. *Paséwá*, in a pure and concentrated state, is a viscid, dark reddish-brown fluid, transparent in thin plates. Its homogeneous physical constitution prevents its assuming to the eye that appearance of consistency which is presented by ordinary opium. In the former, all

* Dr. ABEL believed that fermentation was necessary for the development of the narcotic principles, and considered the fermentation as of a panary species, n which the gluten played a principal part.

the ingredients are in a state of true chemical combination, with the water contained; while, in the latter, many of the ingredients are only in a state of mechanical mixture, a condition which almost necessarily gives an appearance of solidity beyond all proportion to the actual quantity of solid matter contained. Hence, *paséwá*, and opium containing *paséwá*, are less consistent, and would, to the inexperienced eye, appear to contain much more water than pure opium of the same actual spissitude; a source of much perplexity to any one who tries for the first time to estimate, by the consistence, the real spissitude or dry contents of different samples of opium containing more or less of *paséwá*. A tentative process is the only one by which a person can qualify himself to estimate the spissitude with tolerable accuracy. He should, before allowing the *parkhiyas* to state their estimates of the spissitude, form one in his own mind, and make a memorandum of it, noting his reasons for assigning the degree of spissitude on which he has fixed. The result of the steam-drying test, to which small samples of all opium are subjected in the Benares agency, will then enable him to judge on which side, whether under or over-estimate, he has inclined to err, and to avoid the error in his subsequent operations.

12. The constituents of *paséwá* are in a state of chemical combination; and the slow addition of water will not subvert that condition. But the sudden affusion of a large quantity of water on concentrated *paséwá* instantly resolves it into two portions, a dark coloured fluid containing the gum, colouring matter, and super-meconiate and acetate of morphia, and a lighter coloured powder, consisting of the resin and some gluten, and a minute portion of caoutchouc. In making *léwá*, therefore, from *paséwá*, or from inferior opium, the necessary quantity of water should be slowly added, and thoroughly mixed previously to the addition of more water. Pure opium is liable to the same resolution of its component parts, from the sudden affusion of water: if the latter be slowly added and thoroughly mixed, the gelatinous opium will absorb it, forming a species of hydrate, and will retain its tremulous consistence; but if the water be suddenly added in considerable quantity, an immediate separation of the more and less soluble constituents occurs, and the opium loses its gelatinous and adhesive character. When opium is dried up to a certain point, below the spissitude of 80 per cent., it loses the power of absorbing water without decomposition, and cannot be brought to the gelatinous state. It might be expected, that by adding 30 parts of water to 70 of dry opium powder, we should produce a combination possessing the consistence and other physical characters of fresh standard* opium; but

* So called, because this is the degree of spissitude required at the Bengal

the compound has little *consistence*, and will be found to contain insoluble portions, which have lost their power of forming hydrates with water: yet its *spissitude* remains exactly that of standard opium, the precise quantity of dry opium employed in making it being recoverable from it, but in a darkened and deteriorated condition. The above observations have a practical bearing upon the manufacture of *léwá*, as has already been noticed, and upon the degree of spissitude which opium, either in the hands of the *koérís* or in the agency godowns, should be permitted to acquire: it should be limited to 66 or 67 per cent. for the former, and 70 or 72 for the latter; because, with every additional degree of spissitude above this, the solubility is impaired in an increasing ratio.

13. Among some thoughts on the subject committed to writing six years ago, I find the following remark and query: "The whole of the original milky juice will pass through a finer filter than that used by the Chinese in making the extract for smoking: is it possible to dry the opium, retaining its property of such minute division and diffusibility; or is it necessary for the complete separation of the water from the resin, gluten, caoutchouc, &c. that *some* absorption of oxygen should take place, and some consequent diminution of their solubility, or rather miscibility with water?" My reason for noticing this query is the subsequent solution of the proposed problem by M. PREVITE of Calcutta, in the highly similar case of animal milk, which he appears to have succeeded in drying to a powder with no perceptible injury to the diffusibility of its curdy and oleaginous principles. This is the very result that should be aimed at in the preparation of opium for the China market.

14. When the juice of the poppy has been properly dried, that is, rapidly, in a cool shade, and protected from dust, it possesses, at the spissitude of 70 per cent., (that is, containing 30 per cent. of water,) the following properties. It has, in the mass, a "reddish brown" colour *(Werner)*, resembling that of copper (the metallic lustre obstructed); and, when spread thin on a white plate, shews considerable translucency, with a "gallstone yellow" colour, and a *slightly* granular texture. When cut into flakes with a knife, it exhibits sharp edges, without drawing out into threads; and is tremulous, like jelly, or rather strawberry jam, to which it has been aptly compared. It has considerable adhesiveness, a handful of it not dropping from the hand inverted for some seconds. Its smell is the pure peculiar smell

agencies for the full price allowed by Government. On parcels of opium, inferior to this in spissitude, a penalty is levied, called *battá upon consistence.*

of opium, heavy and not unpleasant. In this condition it is said to be "standard" or "*awwal*" opium.

15. When the juice, again, instead of being thus exposed to the air, has after collection been kept in deep vessels, which prevent evaporation, it presents the following appearances. A specimen of it which has the spissitude of only 60 per cent. has the apparent consistence or substantiality of standard opium of 70 per cent. But on minuter examination, it will be found, that this apparent firmness of texture is a deception, resulting from the mechanical constitution of the mass; it being made up with but little alteration of the original *irregular drops* collected from the capsule, soft within, and more inspissated without; this outer portion, as long as it remains entire, giving the general character of consistency to the mass, just as the shells of a quantity of eggs would do. For when the opium is rubbed smartly in a mortar, this fictitious consistence disappears, exactly as that of the eggs, if pounded, would do; and in point of apparent consistence, as well as of real spissitude, it is reduced to the proportion which it properly bears to standard opium. When opium thus retains the original configuration of the irregular drops, it is said to be "*kachá*" or "*raw:*" when these are broken down into the *minute grain* mentioned in the description of standard opium, it is said to be "*pakka*" or "*matured,*" whatever may be the actual spissitude of the opium, whether 50 or 70 per cent. An opinion has been entertained, but on what grounds I know not, that the breaking down of this large grain is an injury to the opium: to myself it seems plain that as the large grain *always* disappears before the opium attains the spissitude of 70 per cent. and as this vesicular constitution of the raw opium retards the evaporation of its superfluous moisture, the more inspissated shell of each irregular drop checking the evaporation from its more fluid interior, the object should be to reduce the whole with the least possible delay to a nearly homogeneous mass, in which state the inspissation of opium advances with much greater rapidity.

16. Connected with this subject is a question which has been raised, whether the inspissation of opium stored in large quantities in the agency godowns is effected more quickly, by removing, from time to time, into another receptacle, the pellicle of thick opium which forms on the surface of the mass; or by turning over the mass frequently, and thus constantly mingling with it the pellicles successively formed. As agreeably to the general law of chemical affinity, whereby the last portions of any substance held in combination, and in course of gradual expulsion, are retained with increasing obstinacy, the inspissation of thin, is, *cæteris paribus*, always more rapid in its pro-

gress than that of thick opium; it is clear that the removal of the pellicle, by which opium of minimum spissitude is constantly exposed to the air, must accelerate the inspissation more than the turning over of the whole mass would do: because the latter process exposes to the air opium which is gradually acquiring a greater degree of concentration, and from which the evaporation will gradually be *slower and slower*. As evaporation takes place from the external surface only, it may be proper here to advert to the propriety of making all reservoirs for opium below the standard spissitude as numerous and shallow as may be permitted by the means of stowage; every practicable method being at the same time adopted to facilitate ventilation across, and to exclude dust from, the extensive surfaces exposed; and as little light being admitted as may be suitable to the convenience of the people at work.

17. It might be expected, from the ingenuity of the natives of this country, and from their imperfect notions of fair trade, that they would resort to a great variety of means for increasing, by adulteration, the weight of such an article as opium, in which fraud might be made so difficult of detection. But in fact, it is seldom that they attempt any thing of the kind, beyond keeping their opium at a low spissitude; an act by which, under the present searching system of examination, they cannot profit; and which, from its occasioning a deterioration of their opium through fermentation, entails the levying of a batta upon its quality, and therefore, in those cases, an inevitable loss. It is impossible that opium left to itself in the open air, during the parching season of the hot winds, could remain at the low spissitudes of 50 and 60 per cent. at which it is frequently brought to Gházípúr towards the end of that season: and we must therefore conclude, that artificial means are resorted to, in order to maintain it in that condition; either the frequent addition of water, or the burying it in a damp piece of ground, which is said to be sometimes done for the sake of security. When these malpractices have been carried too far, the gluten undergoes, in a greater or less degree, the process of putrefaction; the mass of opium first becoming covered with mould, and acquiring an opaque "yellowish grey" colour and a pasty consistence, in which every vestige of the translucency and *grain* of the opium is lost; and the smell becoming venous, sour, and at last abominably fœtid; in which condition the deteriorated opium is fit for none of the purposes of the manufacture, and is always destroyed, and its original value forfeited, by the *koéris*. It is to be hoped that their experience of the unvarying consequences of such folly, and the introduction of a superior class of gomáshtás, will in time convince them of the advantage, as well as

the facility, of bringing in all their opium at very nearly the standard spissitude.

In some cases it would appear, from the fluid state in which they bring it for sale, as if they expected every drop of water which they add to it, to be assimilated and converted into opium. Occasionally, it would seem that they had admitted some suspicions of its having been watered too much; and their only remedy is to drive off the superfluous water by *boiling*: an operation which speedily reduces the mixture to a blackened and charred condition, easily recognized.

18. A more ingenious fraud, but which is seldom practised, is, that of *washing out* the soluble and most valuable part of the opium, and bringing for sale the residual mass. In this process, the opium loses its translucency, and the *redness* of its colour: it loses its adhesiveness also, not adhering to the hand like opium which has not been robbed of its soluble principles; and by these marks, without going further, the fraud is detected. *Sand* is now and then added, to increase the weight; and is at once detected by its grittiness when rubbed between a plate and a spatula.

Soft clayey mud is also, but very rarely, used for the same purpose: it always impairs the colour and translucency; and can, as well as sand, be detected, and its quantity accurately ascertained, by washing the opium with a large quantity of water, and collecting the sediment, which is the clayey mud.

Sugar and *gur*, or coarse molasses, are sometimes employed to adulterate opium: they invariably ferment, and give it a sickly, sweetish, venous, or acescent odour, easily known.

Cow-dung, the pulp of the *dhatúrá*, or thorn-apple, and the gummy resinous juice of the *bél*, or Bengal quince, are seldom met with as fraudulent ingredients: the first may be detected by drying it to a powder, or by washing it with water, either of which processes brings under the eye the undigested shreds of vegetable matter constituting the animal's food; but the two last are extremely difficult of detection, if not added in quantity sufficient to affect the colour and smell of the opium, which generally happens in the few instances of their occurrence. The seeds of the *dhatúrá* are apt to get mixed with the opium, and afford a ready means of detection. A strange, but not uncommon, mode of adulteration is the addition of *pounded poppy seeds*: if reduced to a fine powder, the oleaginous seeds might enter into an imperfect chemical union with the kindred resinoid principle of the opium: but the fraud is never so skilfully effected as to produce this result; and the hard particles of the seeds are perceptible to the touch and sight. Málwa opium, though less now than it was

eight years ago, is in general largely contaminated with oil, which is easily separated by dissolving the opium in water ; and I have seen, in a few instances, the same fraud attempted within the Benares agency. As the oil is always in a rancid condition, its presence is betrayed by its odour, as well as by the glistening appearance which it communicates to the opium.

19. By long exposure to the heat of the sun, the texture of opium, whatever be its spissitude, undergoes a remarkable change, through the conversion of part of its gluten into a species of bird-lime. Its *shortness* or property of exhibiting sharp edges, when cut into flakes with a knife, disappears ; and it draws out into long threads.

These two varieties of texture may almost always be recognized in cakes of Behár and Benares opium respectively ; the former being exposed to the sun, in the process of drying the cakes, and the latter not. This diversity of treatment occasions a difference between the hygrometric properties of the cakes of the two agencies ; the Behár cakes acquiring a more speedy but less permanent hardness than the Benares : whereby, though firmer in the shell towards the end of the hot winds, they are more liable than the Benares to soften and lose their shape during the rains. The immediate cause of this difference appears on making a clean section of the shells with a sharp knife. It will thus be found, that in the Benares shells, the *léwá* remains visibly interstratified with the petals, dark-coloured, and tenacious ; while in the Behár, it is in a great measure absorbed by the petals, which are apparently in intimate contact with each other, and is not to be distinguished from them ; the *combination* being more easily effected by hygrometrie changes of the atmosphere than the *independent* strata of leaf and *léwá* in the Benares cakes.

20. While, as at present, a considerable amount of inferior opium is produced, not safely applicable to any other purpose than the manufacture of *léwá*, its sacrifice is no great loss. But if *all* the opium brought to the agencies were of good quality, the substitution of some less expensive vegetable paste would be an important desideratum. Any strong cheap mucilage or farinaceous paste, or perhaps some indigenous imitation of bird-lime, would answer for the inner portion of the shell ; and an exterior coating of a resinous, waxy, or oily nature, impervious to water, would defend this from the moisture of the air.

21. In cutting open a cake for examination, the above points should be attended to. It should also be observed whether the external and internal surfaces of the shell are smooth : the former not knotty or fissured, and none of the interior leaves of the latter detached among the opium : there ought, also, to be no vacuities between

the strata of the leaves, such as are sometimes found, lined with mould, in faulty cakes, and the shell altogether ought to be thin, compact, and of equal thickness throughout. The shape ought to be as nearly spherical as possible: that being the geometrical form which under the smallest surface contains the greatest quantity of matter, and which consequently affords the least scope for the extrication of air and ultimate injury to the shape of the cake when that air escapes. Greater attention to having the earthen cups, in which the cakes are dried, *perfectly* hemispherical, instead of parabolical as they now are, would contribute to the desired sphericity.

22. In opening a cake, the next thing to be attended to is the manner in which the two hemispheres of the opium separate: the Behár will be found to retain its *shortness*, while the Benares draws out into threads. The smell should then be attentively observed and noted down, being strongest immediately after the opening, and giving at that instant the fairest indications of the state of the opium with respect to preservation; the pure narcotic, venous, or acescent odour being then most strongly perceptible: in this respect the Benares will generally prove superior to the Behár. It is an important character; for the Chinese are great epicures in the flavour of opium, and object to it when it smells at all sour.

23. The surface of the opium should then be narrowly inspected, and the tint and shade of colour, both by reflected and transmitted light, noted down, in terms of Werner's nomenclature; also the apparent quantity of *paséwá* if any be present, which is almost constantly the case with Behár opium, where it appears like dark glistening fluid, lining the little cells in the surface of the opium. As the depth of the colour of opium in the caked state depends on the quantity of *paséwá* in it, or the degree in which it has been deteriorated by exposure to the sun, the lighter the shade, the better is the opium.

24. The chemical analysis of opium, after all the trouble that has been bestowed on it, is still in an unsatisfactory state. A perfect analysis, such as we possess of Peruvian bark, and of some other medicinal plants yielding vegetable alkalies, ought to eliminate the whole of the active principles, leaving nothing at its close but an inert mass possessed of no therapeutic power: and the essential principles thus obtained should equal (or, as in the case of quina freed from its bulky fibrous accompaniment, surpass) in activity, a quantity of the original substance equal to that from which it was extracted. But how greatly inferior are the powers, over the animal economy, of a grain of morphia, in whatever state of purity or saline combination, to the quantity of opium that is required to furnish that single grain! Yet, for all that

we can, chemically, see, we obtain by our analysis the whole of the morphia that is contained in opium. I suspect that the narcotic power is partly lodged in some unknown substance (not narcotine) insoluble in water: for I have, after careful and repeated washing, until it ceased to colour the water, found the insoluble residuum to act as an opiate with considerable energy. Although morphia, in a state of purity, can, like sulphur, be fused without change; yet, when in combination with the other constituents of opium, it is partly destroyed by a much lower degree of heat, greatly under that of boiling water; for the pharmaceutical and Chinese extracts are found to contain very little morphia: still, the former, as is well known, exert great medicinal power, out of all proportion to the quantity of morphia which analysis evolves from them. From all these considerations it would result, that the proportion of morphia obtained, by the analysis at present known, cannot be regarded as a true exponent of the total narcotic power of the opium which yields it. An additional source of fallacy in comparing the produce of different countries exists in the varying proportions which they contain of colouring matter or extraction; a principle for which morphia and narcotine have a strong affinity, forming insoluble compounds* with it; and which, as well as narcotine, is much more abundant in Indian than in Turkey opium. Hence a considerable loss in the purification of morphia from the former, and an apparent, and probably real, inferiority in its quantity; although we know that good India opium is equal to Turkey in narcotic power.

25. ROBIQUET's process is the one employed by the opium examiner in Calcutta. The chief precautions necessary to ensure success and uniformity in its results are, not to use too much water at first; to see that the magnesia is brought to a red heat; not to expose any of the subjects of analysis to the sun, or to artificial heat, except in the washing and final solution in alcohol of the morphia; not to use too strong a spirit in washing the morphia and excess magnesia; and to employ the strongest alcohol for its final solution before crystallization. SERTUERNER's process is useful where it is not necessary to obtain the morphia in a separate state: and in practised hands affords speedy and tolerably accurate information. It is probable that ROBIQUET's process will in time be superseded by that of the late Dr. WILLIAM GREGORY of Edinburgh, which does not acquire the expensive use of alcohol, and yields more morphia, by 30 or 40 per cent.; affording, in fact, the cheapest medicinal preparation known of Turkey

* This may partly account for the medicinal activity of the mass of opium above noticed.

opium. It consists in the exhaustion of the opium with water under the temperature of 90°; concentration of the solution at a low temperature; precipitation by slight excess of ammonia; elutriation of the precipitate with cold water; exsiccation of it at a temperature below 212°, and reduction to powder; solution in cold water by muriatic acid, slowly added in slight excess; filtration and concentration to the consistence of syrup; after which, the preparation on cooling, becomes a mass of crystals of muriate of morphia, moistened with a dark-coloured solution of uncrystallizable muriate of narcotine and resinoid colouring matter. This solution is abstracted from the crystals by strong pressure between folds of bibulous paper; and the solution, crystallization, and expression repeated once or twice; after which, the salt is obtained in radiated bunches of snow-white silky crystals, containing 37 parts of muriatic acid and 322 of morphia. But for the unfortunate super-abundance of narcotine, and comparative paucity of *obtainable* morphia, in Indian opium, the manufacture of the muriate on a large scale might advantageously be established, at one of the Bengal agencies, for the supply of the Indian medical department with this admirable preparation, the marc (?) of which would be available for the manufacture of *léwá*.

26. Connected with the subject of analysis is another which claims some attention from the opium examiner, the accuracy and sensibility of the weights and balances used in his department. Neither of them should ever be allowed to be soiled with opium; and the former should occasionally be compared, to see that all weights of similar denominations mutually correspond within one-tenth of a grain, and that the larger and smaller weights are equally accurate multiples and sub-multiples of each other. The knife-edges of the balances should occasionally be sharpened, so that they may turn with as little friction as possible; and the three points of suspension, whenever deranged, should be brought into a perfectly straight line, by bending the beam with the hand: if the centre edges be too low, the balance will, when loaded with its proper weights, be in a state of unstable equilibrium, and will cause great mistakes; and if they be too low, the balance will lose its sensibility, and cannot be depended upon within perhaps two grains. Care should also be taken that the distance from centre-edges to arm-edges are exactly equal; from accidental violence, this element of accuracy is very apt to be deranged, and causes great confusion when overlooked.

27. Were all the opium brought for sale unexceptionable in quality, free from *paséwá*, and liable to battá on account of deficient spissitude only, there would be, supposing the batta levied with tolerable accuracy, little difference at the end of the manufacturing season, between

the registered receipts and expenditure of opium: and, supposing it levied with *strict* accuracy, there would be a small loss, occasioned by accidental spilling of semi-fluid opium, adhesion to the persons and clothes of the work-people, and other unavoidable sources of wastage. But as, in the present state of things, batta to a considerable amount is levied on quality, the effect of its deduction, if not kept separate from the battá on spissitude, would be to shew, at the end of the year, a deceptive deficiency of receipt compared with expenditure. Battá upon quality, or *paséwá*, therefore, should not be admitted into the godown accounts; and should be confined to the account between the receiving-officer and the *koéri*.

28. There are no satisfactory experimental means, except perhaps by the specific gravity, of ascertaining the precise quantity of *paséwá* in opium. It will hardly drain at all from opium of higher spissitude than sixty per cent. and not readily from opium of even that spissitude, unless assisted by a slight fermentation, which greatly facilitates its flow: the *paséwá* trickling down the sides of the air-vesicles thus formed. The only convenient rule for the adjustment of battá upon *paséwá*, or upon quality generally, is, that absolute *paséwá*, if not too thin, and the worst opium purchased for the Company, being paid for at half the price of standard opium; for different grades of inferiority in quality between those two conditions, as fair a gradation of penalties shall be fixed, as can be formed from an estimate of the sensible qualities.

29. It has been thought, that specific gravity might prove an accurate index of the spissitude of opium; which is, however, not the case; its soluble principles, and that portion of its insoluble constituents which, slightly modified, unite with the soluble in forming *paséwá* acquiring in their transition to this altered state, a considerable increase of density. Opium, therefore, containing *paséwá*, is much heavier than an equal *bulk*, at the *same* spissitude, of pure opium. I have found this condensation to bear same proportion to the quantity of *paséwá* apparently contained: and it might, probably be found to indicate with considerable accuracy the proper amount of battá to be levied for *paséwá*, were such nicety desirable or conveniently attainable.

30. The Regulation of Government, which requires Civil Surgeons to report upon the relative values of parcels of confiscated opium, according to the quantity of foreign matter which they may contain, is obscure on two important points: 1st, whether, and beyond what degree of thinness, *water* is to be considered as foreign matter; and, secondly, whether and beyond what degree of deterioration,

fermented and *paséwá*, converted opium, when contained in the contraband article, are to be considered as "foreign matter." I have been in the habit of regarding them as foreign, when the water exceeded 30 per cent., and when inferiority in quality was palpable; because a different practice would defeat the end, for which the regulation was framed, of securing a fair reward to the informer. Under a less strict interpretation of the rule, he would be tempted to double the weight of the seized opium, and consequently his own reward, by adding to it, a sufficient quantity of water, or of bad opium, such as may at all times be clandestinely purchased for a trifle in the poppy districts.

IV.—*Catalogue of a Second Collection of Fossil Bones presented to the Asiatic Society's Museum by Colonel* Colvin.

[Exhibited at the Meeting of the 6th April.]

Colonel Colvin's first dispatch consisted of six large chests of fossil bones, in their rough state, attached to the matrix rock, as they were originally brought in from the hills by the native collectors employed by him to dig. They still remain unclassified in the museum, but the detailed examination that has been given to the second dispatch by Lieutenants Durand and Baker, whom experience has already made expert in recognizing fragments, even much mutilated, will materially assist in arranging the former specimens, while it leaves little to be done with the present beyond publishing their catalogue at once for the satisfaction of geologists, and preparing the specimens for the inspection of visitors. There are among them many noble fragments of known animals, which challenge comparison with those of any collection in Europe: these it will be a first object to make known by accurate drawings or by plaster casts. There are also numerous skulls, jaws, teeth, and bones decidedly new to fossil osteology, but the admirable fidelity and scientific knowledge with which the major part of these is now under illustration by Dr. Hugh Falconer and Captain Cautley, in the Asiatic Researches, from their own, even more extensive, cabinet, supplants the necessity of attempting a full investigation here. All points in which differences from their generic or specific descriptions are recognized, it will be the duty of our curator to bring to notice.

The synopsis published in the Journal for December last, page 706, comprised the varieties of organic remains, up to that period extracted from the upper deposits of the tertiary strata of the *Siválik* or *Sub-Himálaya* range of hills. Most of the same are to be found in Colonel Colvin's collection. Some recent additions of a highly interesting

nature have however been made above, of which I have been apprised in my private correspondence with Seháranpur.

Lieutenant DURAND has just dug out a nearly perfect head of a *Palæotherium*, from the vicinity of the spot whence Captain CAUTLEY had previously extracted the *Anoplotherium* of CUVIER. The Dadúpur museum possesses a fragment "of the lower jaw of a huge new animal: the teeth not sufficiently perfect to determine its nature: it is probably of some grand new pachydermatous animal, equalling the elephant in size." Both the rhinoceros and the camel have characters of indubitable variation from known species. Of both these, notices are now in preparation. The acquisition of fossil birds was noticed at the meeting of March: Dr. FALCONER supposes them to be bones of large *Grallæ*. This is, as he says, a fair test of the justice he and his fellow labourers are doing to the enquiry: it is not every museum in Europe that has fossil birds to shew! A note this moment received announces the acquisition of "a superb specimen of gigantic size of an unknown species of crocodile: it forms an intermediate section in the genus between the true crocodile or *magar*, and the *leptorynchus* or *ghariál*. The muzzle is cylindrical, as in the latter, but greatly shorter; and the teeth are thick and shorter, as in the *magar:* they protrude in relief above the jaw three inches, and are 1 inch and 2 lines in diameter!" There is also in Col. COLVIN's collection a Saurian head, apparently new.

I have ventured to alter the numbering of the catalogue, to save repetition, by bringing bones of the same animals together, the original having been written out by Lieutenant BAKER just in the order they came to hand. It will be observed, that great pains have been taken to unite together with cement specimens which were broken in extraction, and in clearing them from matrix. The necessity of the latter operation will be acknowledged on perusal of the following extract from Colonel COLVIN's note to me of the 4th October last. "The quantity I found collected here on my return, and what had to be brought in proved to be so great, that in the matrix they would have loaded a boat; during the rains, therefore, I employed a number of people to clear them, and though a vast number have thus been rejected as superfluous, or too mutilated to be useful, still a great deal has been packed that might perhaps have well been left behind, had I not feared to attempt a selection." The same letter adds:—

"I have been unfortunate in not meeting with specimens of teeth of the Sivatherium, or complete heads of the hog. I had one lower end of the radius of what appeared to be the camel, but as a few specimens also deemed "camel" had come into the Dadupur museum*, I made

* Since certified by the discovery of an entire head.

over this bone to it with the view of identification, and should the further search prove successful, you will receive specimens of the animal from Lieutenant BAKER.

"The clearing away of the matrix, besides rendering the specimens less cumbrous for transmission, enabled, I should hardly say *us*, for it was my young friend, here to give names to most of what are now sent. The locality of each I found it impossible to particularize, as the parties, whom I sent out to collect, ranged about in the lower hills, picking up whatever they found, and heaping all together, until they had amassed several cart loads; but the eastern limits of their search were the branches of the *Sombe*, which are about due south of the *Chúr* mountain; and to the west, their search extended to about half way between *Náhan* and *Pinjór*. The only distinction worth noticing is, that the hard or brown fossils (those mineralized with hydrated oxide of iron) did not come out of the same stratum as the blue and friable (calcareous) ones; the latter being from the west of *Náhan*. You will perceive the difference of the matrix on several of the specimens only partially cleared. I have never had leisure to visit the sites myself, and would therefore add nothing on this subject until I shall have enjoyed the opportunity of a personal inspection."

The Society will doubtless be eager to do every honor to the munificent donor of these splendid fossils, if it has any real wish to acquire the reputation of possessing a valuable museum. The foundation of our fossil collection was but laid four years ago, and already through the contributions of Colonel BURNEY, Dr. SPILSBURY, Captain SMITH, Mr. DEAN, &c. now enriched by Col. COLVIN'S vast store of specimens, it has become necessary to devote an entire apartment to this instructive department of natural history. Our smallest return of gratitude to those who have been at such considerable expence in promoting the Society's interests, will be to do honor to what has been so generously bestowed, by making up fit cabinets to exhibit them to the best advantage, and by spreading the knowledge of them as expeditiously and widely as possible.

J. P. Sec.

Catalogue of Colonel Colvin's Fossil Bones.

MASTODON ELEPHANTOIDES.

1	Upper jaw, very perfect.
2	————, fragment.
5-6	Lower jaw, part of the right half.
7	————, ditto left half.
8	Symphysis of ditto, (or of elephant.)
11 to 26	Fragments of molars, of both jaws.
31	Axis of a large mastodon (?) very perfect.
32	Cubitus, upper extremity, with olecranon.

MASTODON LATIDENS, identified with Elephantoides, FAL.

36 Lower jaw, right half.

ELEPHAS PRIMIGENIUS.

41 Upper jaw, right half.
42 to 47 Lower jaws, left half, and fragments.
48—49 ————-, right half.
50 ————-, left half of a younger animal.
51—56 Molars, fragments of.
57 59 ———, of smaller animals.
60 Upper jaw of a small animal, much mutilated.
61 to 80 Tusks, fragments of various sizes.
81 Femur, upper and (? mastodon).
82—87 ———, lower end.
88—91 Humerus, upper end.
92—95 ————, lower end.
96 Cubitus, upper extremity.
97 Tibia, perfect specimen.
98—101 ——, upper extremities.
102—104 Calcaneum.
105 Axis, of very large size.

HIPPOPOTAMUS.

111 Cranium.
112 Upper half of the head, very perfect in bone.
114—117 Upper jaw, perfect, and fragments.
119—123 Lower jaw, in various preservation.
124 Fragment of ditto, with two central incisors.
125—126 Condyles of ditto.
127—129 Fragments of molar teeth.
130 135 Canine teeth, fragments of upper.
136 ————, of lower jaw.
140 Pelvis, fragment of the.
141—143 Femur, lower extremity.
144 Cubitus, upper extremity, with olecranum.

RHINOCEROS.

150 Upper jaw, fragment.
151—153 Lower jaw, fragments much mutilated.
154 Teeth, three fragments of molars.
155 Axis, doubtful.
156—8 Scapula, three fragments, doubtful.
159—163 Humerus, upper extremity.
164 ————, lower extremity.
165 Cubitus, upper end.
166—169 Femur.
170 Radius.
171 Tibia, with tarsal and metatarsal bones attached.
172—175 ——, fragments.
176—180 Metatarsal entire.
177—179 Metacarpus.
180 Calcaneum, perfect.
181 Astragalus, perfect.

SUS.

182 Right jaw of some animal of this genus.

Bones of Pachydermatous animals not classified.

185 Lower jaw of a small animal.
186 Molar teeth, much mutilated.
187—210 Vertebræ, cervical; 191, process of dorsal, 192.
212 A very large specimen of do.
213—219 Humerus, fragments of lower extremity.

220 Femur, upper extremity of.
221—223 Condyle of do.
224—229 Tibia.
230—232 Radius, lower extremity.
233—235 Carpus and tarsus.
236 Metacarpus, small.
237—238 Metatarsus.
239—246 Phalanges.
247—248 Astragalus.
249—250 Omoplate; socket of do. 251—253.
251 Pelvis; socket of do. 252.

HORSE.

260 Upper jaw, attached to the humerus of a rhinoceros, &c.
261—264 Molar teeth.
265 Atlas?
266 Femur, lower extremity.
267 Radius, ditto.
268 Cannon bone.
269 Astragalus.
270—271 Phalanges.

BOS.

280 Head of some species of ox.
282 Left upper jaw, fragment of.
283—289 Lower jaw, fragments.
290—293 Molar teeth.
294—295 Femur, upper extremity.
296—297 Horn, fragments.

ANTELOPE.

300 Head and horns, portion of the.
301 Occiput.
302—303 Upper jaw.
304 Lower jaw, or of a small deer?
305—306 Posterior part of head, (or of a deer?)

DEER.

310 Upper jaw, molars enveloped in matrix.
311 Ditto of smaller animal.
312 Lower jaw, with metatarsal attached—alone 313, 314.
316 Left lower jaw of young animal with milch teeth.
317 Posterior molar of large deer: smaller 318.
318 Germ tooth (?)
319—321 Antlers, fragments of.

Bones of various Ruminants, unidentified.

325—326 Cranium with occiput.
327 Lower jaw, back part, large animal.
328—344 Molars of a large animal, 345.
345—358 Cervical vertebræ, small: three connected, 359.
360 ———, of a gigantic ruminant. (? *Sivatherium.*)
361—364 Dorsal vertebræ.
365 Lumbar vertebræ.
366—367 Sacral vertebræ.
368—372 Very large vertebræ.
373 Axis.
374—375 Atlas, large, one broken.
376—379 Scapula, glenoid cavity of, 380.
380—383 Humerus, upper extremity.
384—406 ————, lower extremity.
407—409 Femur, fragments.
410—429 Tibia.

430—439 Radius, upper extremity.
440—449 ———, lower extremity.
450 ———, with carpal and part of metacarpal.
451 ———, perfect, with part of ulna, fragments, 452.
453 Calitus.
454—466 Carpal and tarsal bones.
467—527 Metacarpal and metatarsal bones.
528—537 Astragalus.
538—551 Calcaneum, very large.
552—562 Phalanges.
563 Ribs, fragment of.

HYÆNA.

600 Upper jaw, in good preservation.
601 Canine and 1st molar of do.
602 Lower jaw, entire, and fragment, 603.
604 Cranium.
605 Three molars of some canine animal.
606 Metatarsal bones of some carnivorous animal.

SAURIAN.

700—717 Vertebræ of Saurian reptiles.
718 Cranium of *Gharial.*
719—724 Plates of crocodilidæ.

Besides about 120 fragments not identified, received with the second dispatch; the whole of the first donation unregistered, and some gigantic testudinous plates, presented by Col. COLVIN personally while in Calcutta.

GIGANTIC ELK, (presented by Mr. Conductor W. DAWE,) found in the *Ganawer Khál*, near the *Haripál* branch of the *Sombe* river.

D 3 4 Portions of the antler.
D 5 Axis of second cervical vertebra.
D 6 Cervical vertebra of do.

BUFFALO? presented by the same.

D 1 Head of bos or buffalo with one horn.
D 2 Piece of horn, supposed to belong to the same.

V.—*Notice of a Visit to the Valley of Kashmír in* 1836. *By the Baron* HUGEL.

[Read on the 6th April.]

On my way to Bombay to embark for Europe, I take the liberty of addressing you a few lines, requesting your doing with them what you think best: they relate to my journey to Kashmír. I was in hopes of being able to send you a more elaborate memoir, but my time is very much limited, that I am afraid of postponement, and hasten rather to offer you a few notes as they were collected. I understand that Mr. JACQUEMONT'S travels are now published. I think therefore that it may be of some interest to the Indian reading public, to have before it some observations, not influenced by the above mentioned work, made by a traveller a few years later, to compare them together. As

before a regular publication of my residence in 1835 can be made in Europe and reach India, that of Mr. JACQUEMONT will have lost much of its interest as a new topic, I do not hesitate to come forward with my notes in their original form, how unfavourable to them it may be.

Kashmír in a political and financial point of view, has been much overrated: not in a picturesque one. The valley in its length, from N. W. by W. to S. E. by E. is little more than 80 miles long; the breadth crossing the former line, varying from 30 miles to 6. I speak of the actual plains: from the eternal snow of the Pír Panjáhl to the Tibet Panjáhl are 50 to 60 miles: both ranges run nearly parallel in the first direction, with a great number of peaks. The height of the passes from Bimbar to Kashmír, and that from Kashmír to Iscardo is the same, 13,000 feet; the highest point of the Pir Panjáhl, 15,000 feet by the boiling point. The city of Kashmír 6,300 feet*; Kashmír town, Daláwer Khán Bagh on the 19th November, gave meridional altitude 72° 4′, artificial horizon, which shews its northern latitude to be 34° 35′.

Population.—Four years ago about 800,000; now not exceeding 200,000. The valley is divided in 36 perganahs, containing ten towns and 2,200 villages. Kashmír town contains still 40,000 inhabitants; Chupinian, 3000; Islámabád and Pámpur, 2000. It was not the bad administration of the Sikhs, but a famine brought on by frost at the time the rice was in flower, and cholera in consequence of it, that reduced the population to one fourth of the former number by death and emigration: many villages are entirely deserted. Chirar town contains now 2000 houses and only 150 inhabitants!

Revenue.—Last year very nearly nothing, RANJI'T SINGH wishing that the country should recover: this year (1836) he asks 23 lakhs from the Governor MOHAN SINGH, which the country cannot give. The emigration has brought to the Panjáb and Hindustán many shawl manufacturers, and Kashmír will most likely *never* yield again what it did a few years ago. Núrpur, Lodiána, and many other places can bring to the market shawls cheaper than Kashmír, where every article of food is dearer than in the Panjáb and Hindustán.

Twelve passes, *Pansahl* in the Kashmír language (from which Pir Panjhál of the Musalmans) now exist; three to Tibet (Iscardo and Ladak); eight to the Panjáb; one to the west. In former times there were only seven: the defence of which was entrusted to Malliks with hereditary appointments: four passes are open the whole year: one to Ladák, the western pass, (Baramulla,) and two to the south.

* Three thermometers brought it very near to the same height.

Wuler lake is 30 miles from E. to W.

Brahmans, the only Hindús in Kashmír, 25,000 in 2000 families; they are Vishnuvaites and Sivaites, divided into three divisions, who all intermarry: they are darker than the other inhabitants, owing to a colony sent for from the Dekhan about 800 years ago, after the aboriginal Brahman race was nearly extinguished by the persecution of the Muhammedans.

There is not in the valley the slightest appearance of its having been drained: the pass through which the Jhelum found its way is one of the most beautiful of the world: its bed 1000—1500 feet deep: I do not believe more in the traditions of the Kashmírian Brahmans than in the fables of Manethon.

All the remaining temples are Bauddha, of a different shape from any I have ever seen; only one small one reminds me of the caves of Ellora: I have observed no Dagoba. Korán Pandan, near Islámabád, Anatnagh of old, is not only the largest ruin of Kashmír, but one of the splendid ruins of the world:—noble proportions;—material black marble. I was nearly led into error, at first thinking its form Grecian. The building had nothing on a closer examination which could justify such a hypothesis. Very few temples remain in Kashmír in tolerable preservation, having mostly been destroyed by a fanatic Musalman*, whose zeal did not succeed in overturning them all.

The only trace of fossil remains in the valley is in a limestone, which contains small shells.

Nature has done much for Kashmír, art more; the whole valley is like a nobleman's park: the villages, being surrounded with fruit trees, and having in their centre immense plane and poplar trees, form large masses, having between them one sheet of cultivation, through which the noble river winds itself in elegant sweeps.

The botany of Kashmír is not rich, and is very nearly allied to that of the Himálaya, between Massuri and Simlah: in the valley itself not a plant is to be seen of indigenous origin: the northern declivity of the mountains is rich in vegetation, the southern steep and barren. The Chunar is the *Platanus Orientalis*, which so far from being a native of Kashmír does there produce no germinating seeds, and is multiplied by cuttings, which, since the Moghul Emperor, have not been kept up. It is a very extraordinary phenomena to witness the *Nilumbium speciosum* growing where the orange tree is destroyed by frost. *Misri yaleb* is not a native of Kashmír.

I made a remark on the Pir Panjhál, which I afterwards had occasion to observe several times, and which is new to me: that the freez-

* Sikandar, Bhutshikan, A. D. 1396.

ing point on the thermometer advances at great elevations in a similar proportion as the boiling point retrocedes : thus the water boiling for instance with 191, the sun with 44 degrees Fahr., did not make any impression upon a piece of ice lying on a black soil, the latter not being moistened*. This must be the case, although I do not recollect to have seen it mentioned : on a certain height above the surface of the globe, the freezing point and the boiling point must meet†, heat and cold being phenomena belonging exclusively to our globe. My observations led me to believe, that this may be at 84,100 feet above the surface of the sea, or in other words that there finishes our atmosphere.

The burning gases at Jwalamukí are of a very extraordinary nature, nothing of sulphur or naphtha in them. They have a most delicious smell, something like a French perfume with ambergris. The flames, about 10 in number, come out of a dark grey sandstone on perpendicular places : temples are built over them : I attributed the effect to priestcraft, until in one of the temples called Ghurka Debi, I was allowed to try experiments, and remained alone : I blew out the flame, which did not re-ignite from itself : there is nothing particular on the places where the flame came out : no change in the colour or substance of the stone, or in its hardness. Water in small quantity is formed in little reservoirs under the flames, being the produce of them : this water takes fire too from time to time, when enough inflammable matter is collected on the surface. I took a bottle of it for you, which Captain Wade will be so kind as to forward to you for examination‡ ; it has however now undergone a terrible alteration by putrefaction, and I am afraid that you will not be able to analyse it. The taste of it when fresh can distinguish nothing of its composition : it is not unpleasant to drink, and of a milky-greenish colour. No traces of volcanic matter near it.

I have picked up many coins, which appear to me new ; of some I am certain : those of the Kashmírian kings, of the Bauddha time, found near the town Bij Bahara (no doubt a corruption of *Vidya vihara*, temple of Wisdom, if my Sanscrit does not forsake me) : I intended sending them to you, but they found their way in one of my tin boxes : I cannot guess in which, and for this reason do not open them : whenever I come to them I shall send you them, or their exact likeness.

* The explanation of this circumstance should rather be sought in the dryness of the air at such an elevation ; and the consequent rapid evaporation which carried off the ice as it melted—ice itself will, it is well known, wholly evaporate in a vacuum.—Ed.

† By Dalton's tables, the aqueous tension of freezing water is 0.20 inch ; therefore water will boil and freeze together at a height of 130560 feet, or about 25 miles.—Ed.

‡ This had not yet reached us : nor the coins, which we desire much to see.—Ed.

VI.—*Note on an Inscription at Bamyán. By Mr.* C. MASSON.

[Read at the Meeting of the 6th April.]

Of the antiquities of Central Asia, the Idols at Bamyán have long been known and celebrated in Europe. To ascertain their character is still a desideratum. An inscription found in so fortunate a situation, as at the summit of the niche in which stands the larger, and by inference, the more ancient of the idols directly over its head, will, if capable of being interpreted, dispel much of the mystery attaching to it and its associates. It contains but six characters as here exhibited*, appears to be entire, and although the copy of it was taken four years since, I think its fidelity may be depended upon.

When in possession of Mr. PRINSEP's plates of the Pehlevi Alphabets, this inscription was compared with them, and its characters appeared to me to approach nearest to those of the Pehlevi of Sassanian coins from MARSDEN. Observing the apparent recurrence of the two first letters, and concluding that the alternated characters must be consonants and vowels, of the latter of which A was the more likely to be used as the more common, I sought its equivalent in the Pehlevi alphabet noted, and found it might be expressed by 𐭥. Marking also the number of the characters of the inscription, in union with the duplication seemingly of A or U, the word NANAIA occurred to my imagination, and attempting to write it in the Pehlevi of the alphabet, I produced

𐭭𐭭𐭥𐭭𐭩𐭥

The first five letters were so similar to those of the inscription, that I judged I might without imputation of temerity bring the circumstance to notice; and as for the final letter, if we are pretty sure of all the preceding ones, we may reasonably be satisfied with that also. The à of the alphabet, or 𐭩 has indeed a ?, or doubt, attached to it, while the final letter of the inscription resembles the A or à of other alphabets.

The idols of Bamyán, perhaps less ancient than many of the caves or temples there, have not an antiquity beyond the reach of verification, and while we pause whether or not to ascribe them to the princes we call Indo-Scythic, we dare affirm that they were constructed during the period of the Sassanian sway in Persia, or 220 A. D., and the era of Muhammedanism.

Kábul, 1836. C. MASSON.

* See Plate VI. fig. 1; we confess the similitude of the marks, which Mr. MASSON takes for letters, to the Péhlevi alphabet is but just sufficient to hazard a conjecture upon. *Nanaia*, a female, would not be applicable to a male figure: —*Nanao* or *Nanano* (lunus) would be more consonant with the Péhlevi, and even with the form of the supposed letters.—ED.

VII.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 6th April, 1836.

G. J. Gordon, Esq. Senior Member present, in the chair.

Lieut.-Col. Caulfield, was proposed as a Member of the Society by Mr. James Prinsep, seconded by Mr. Piddington.

Mr. J. S. Stopford requested that his name might be withdrawn from the Society. Mr. Stopford had deposited 80 Rupees with the Secretary, to cover the cost of four volumes unfortunately lost by the wreck of his pinnace, until they shall be replaced from England.

Read letters from Lieut. A. Cunningham, Engrs., and Rája Vijaya-Govinda Singha, acknowledging their election as Members.

Also, from Professor T. Rosen, acknowledging his election as an Honorary Member.

A private letter from M. Eug. Burnouf, Secretary to the Asiatic Society of Paris, noted the arrival of the 100 vols. of the Tibetan Kahgyur, and of the other dispatches sent by General Allard.

Read letters from the Secretaries to the British Museum, and the Royal Asiatic Society, returning thanks for the Tibetan Dictionary and other works.

Extract of a letter from Professor Wilson, intimated the distribution of the Tibetan works sent home for the various continental learned societies. It also reported that a portion of the Moorcrort papers had been finally placed with Murray and Co., for commencement of publication.

Professor Wilson estimates that the whole will occupy, when re-written, and shorn of repetitions and redundancies, two octavo volumes. The terms agreed upon are, that 50 copies are to be at the Society's disposition. Any final loss on the publication to be made good by the Society: and the relations of the author to participate in any success.

Read a letter from M. Csoma de Körös, saying that although the fac simile from Iskardo, taken by Mr. Vigne, was evidently Tibetan, it was in too imperfect a condition to be decyphered.

Library.

The following books were presented to the Society:

A copy of the Appendix of the third volume of the Transactions of the Royal Asiatic Society—*by the Society.*

The Journal of the Royal Asiatic Society, No. 4—*by the Society.*

A children's map of the world in Bengalí—*by Rája Kálikrishna.*

A daily register of the tide in the harbour of Singapur, from 1st Sept. 1834, to 31st Aug. 1835—*by the Government.*

Meteorological Register for the months of January and February, 1836—*by the Surveyor General.*

The Indian Journal of Medical Science—*by the Editor.*

The following received from the book-sellers:—

The Political and Statistical History of Guzerát, translated from the Persian by James Bird, Esq., and published by the Oriental Translation Fund.

Lardner's Cabinet Cyclopedia—*Literary Men, vol. 2nd.*

The following letter from the Minister of Public Instruction in France, addressed to the President, was read :

" *Paris, le* 24 *Juillet*, 1835.

" Monsieur le Président, La Société Asiatique de Calcutta, en mettant à la disposition de feu M. VICTOR JACQUEMONT, tous les matériaux scientifiques qu'elle possédait, lui a donné les moyens de rassembler des documens d'un haut interêt sur les Indes Orientales.

En témoignage des services rendus à notre compatriote, je vous prie, Monsieur le Président, de vouloir bien faire agréer à la Société de Calcutta un exemplaire de l'ouvrage qui se publie en son nom, par les soins de sa famille et sous les auspices du Gouvernement Français.

Je tiens à votre disposition, Monsieur le Président, les livraisons qui ont dejà paru : Vous pourrez les faire retirer du Depôt des Livres de Souscription au Ministère de l'Instruction publique par tel moyen que vous jugerez convenable.

Ageréz, Monsieur le Président, l'assurance de ma haute considération.

Le Ministre de l'Instruction publique,

GUIZOT."

Resolved, that the President be requested to return thanks for this mark of consideration in the French Government, and that the Secretary take immediate steps to obtain possession of the work in question.

The Secretary announced the transfer and deposit in the Society's rooms of the Sanscrit, Persian, Arabic, and Hinduí Manuscripts from the College of Fort William.

The number of the Sanscrit works is 1130 volumes : of the Arabic and Persian 2676 volumes. A *catalogue raisonnée* of the whole had long since been prepared by the College officers, of which the meeting resolved it should be recommended to the Committee of Papers to undertake the immediate publication, adding to it such other original works as the Society might possess on its own shelves.

The Secretary apprized the Meeting of the completion of the 2nd volume of the Mahábharata, copies of which were ready for distribution to the subcribers.

Museum of Antiquities.

Read a Note on an Inscription at Bamyan, by M. C. MASSON.

[Printed in the present number.]

The two Buddhist Images, with Deva-nágari incriptions, mentioned in a letter from Colonel H. BURNEY, Resident at Ava, read at the last Meeting, were received, and a paper was read on *Tagoung*, the place of their discovery, an ancient capital of the Burmese empire.

[Printed in the present number.]

A drawing of the full size of the sculptured impression of GAUTAMA'S foot in Ava, was presented by Ensign PHAYRE, with a description of the contents of the several compartments.

The image brought to the notice of the Society by Lieutenant KITTOE, in January 1835, sought out by Mr. Dean and transmitted for the Museum, had arrived with Col. COLVIN'S dispatch.

This image does not seem to possess any characteristic difference from the ordinary sculpture of the Hindus, as had been imagined. The dress and attitude are of common occurrence ; the feet rest on the lotus plant. The head has been struck off, doubtless in the period of the earlier Muhammedan incursions.

Specimens of spears and other warlike instruments from New Zealand were presented by C. K. Robison, Esq.

Physical.

The Secretary announced the arrival of the second dispatch of Colonel Colvin's donation of Sub-Himálayan fossils, which were placed in the Museum, and lighted up for inspection of the Members present.

The catalogue of this splendid collection, drawn up by Lieuts. Durand and Baker, is printed in the present number. The meeting resolved that the special thanks of the Society should be presented to Colonel Colvin, and that suitable cabinets should be constructed for containing and preserving his donation.

With the foregoing were received the remains of the fossil Elk and fossil Buffalo, presented by Conductor Dawe, and alluded to in his letter read at the Meeting of the 6th May 1835.

The cervical vertebra and portion of antler were depicted in the 44th plate of vol. iv. The Bovine head, a very fine specimen, and materially different from Dr. Spilsbury's from Narsinhpur, will be published shortly.

The following acquisitions to the museum of natural history were made :

A live specimen of *Histrix Cristata,* common Porcupine, presented by Mr. James Prinsep, to whom it was given by Mr. Stephenson, who found it in the Bakra mound in Tirhut.

A specimen of *Cercocobus Sabæus,* presented by C. C. Egerton, Esq.

Specimens of the skulls and horns of *Cervus Muntjak, Antilope Cervicapra, Antilope Chikara, Antilope T'har,* and *Capra Jemlahica,* horns of the *Antilope Hodgsonii,* and *Cervus Aristotelis,* the skull of a species of *Sciuropterus,* and the head and bills of *Buceros Malabaricus* and *Platalea Leucorodia,* presented by Lieutenant Vicary.

A specimen of *Cerinaceus Auritus,* and one of the Nilgherri Woodcock, presented by W. H. Smoult, Esq.

Specimens of *Pitta Brachyurus, Picus Tiga (?)* and *Pterocles Quadricinctus,* presented by Lieutenant Vicary.

[The *Picus Tiga,* figured in Hardwicke and Gray, and described by Horsefield, Linn. Trans. vol. xiii. and Latham, Gen. Hist. vol. iii., has only three toes; but both the figure and descriptions agree so exactly in all other respects, with the present specimen, which has four, that I have little hesitation in referring them to the same bird. J. T. P. *Cur.*]

A specimen of *Strix Flammea ;* presented by P. Homfray, Esq.

Specimens of the nest of *Hirundo Esculenta,* the Esculent Swallow, in several stages of preparation, by Ensign A. P. Phayre.

Seeds of the Cane tree, from the Straights, presented by Dr. Vos.

Mr. Hodgson transmitted an account of a new genus of Carnivora, to which he proposes to assign the name of *Ursitaxus.* The skull of the animal was intrusted by him to the Secretary for the inspection of Members.

[This paper will appear in the Physical Researches.]

On the motion of the Secretary, it was *resolved,* that the Right Honorable Lord Auckland be solicited to accept the office of Patron of the Society ; and that the President be requested to communicate with His Lordship on the subject.

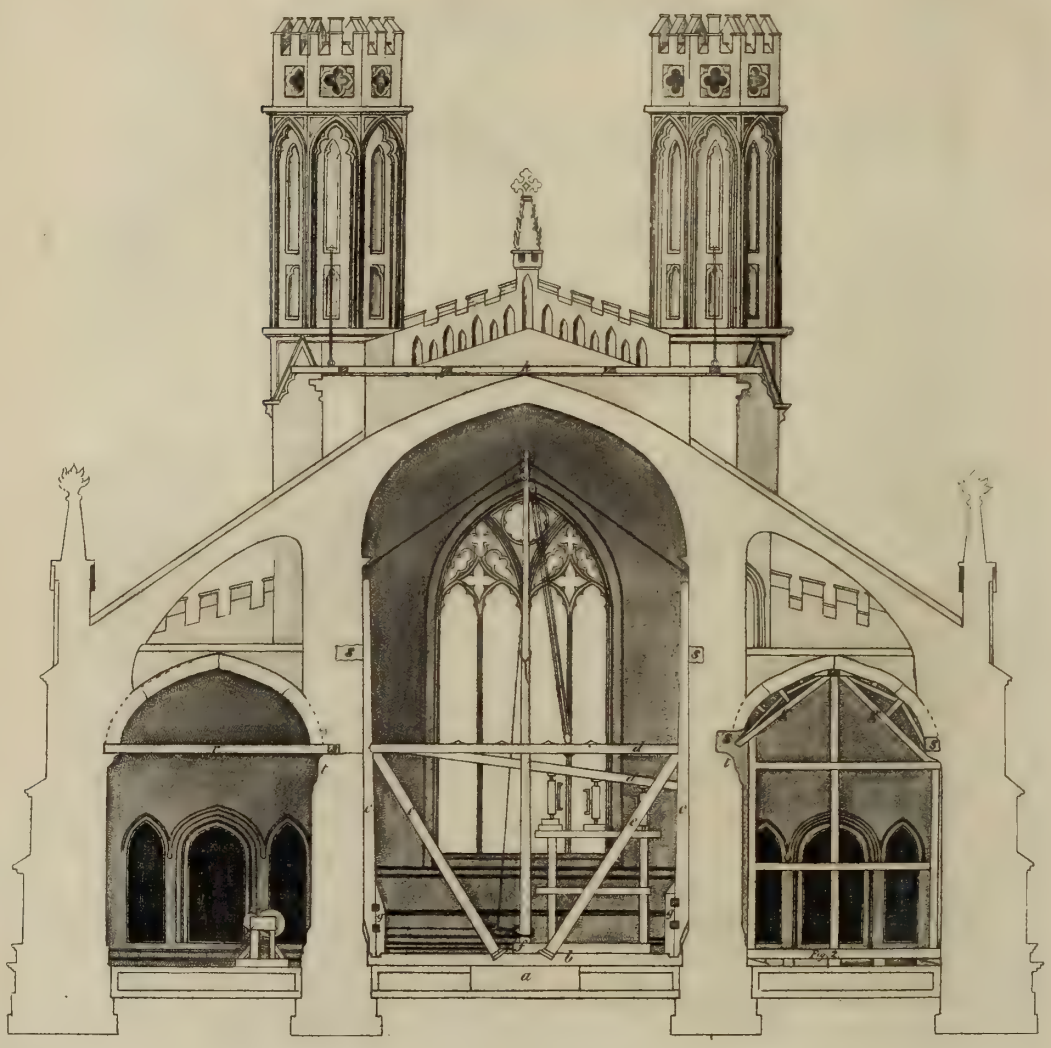
Meteorological Register, kept at the Assay Office, Calcutta, for the Month of March, 1836.

Day of the Month.	Observations at 10 A. M.								Observations at 4 P. M.								Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Wet Barometer at 32°.	Aq. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	New Stand. Barometer red. to 32°.	Old Stand. Bar. at 32°.	Wet Bar. at 32°.	Aq. Ten. deduced.	Thermometer in air.	Diff. or M. T. Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	4 P. M.
1		,884	28,030	0,854	75,3	4,5	3,4	96		,762	,782	0,980	78,3	14,2	13,8	70	56,0	93,6		o.	sw.	nw.	clear.	clear.	clear.
2		,937	,048	0,889	75,7	6,1	5,4	93		,834	,812	1,022	79,6	15,5	14,3	68	67,6	93,3		W.	se.	S.	cloudy.	do	do
3		,987			77,1	8,0				,772			82,8	18,6			67,1	94,5		s.	s.	o.	fog.	do	do
4		,967			76,4	11,2				,797			83,2	19,6			64,1	84,6		o.	o.	se.	th. fog	do	do
5		,915			76,7	6,9											61,2	95,3		sw.	o.	o.	do	do	do
6		,919			78,1	5,7				,777			85,0	19,8			64,3	94,8		s.	o.	o.	do	do	cloudy.
7		,899	,836	1,063	80,0	6,2	5,3	93		,789	,676	1,113	82,6	8,9	8,0	88	67,5	90,3		s.	se.	sw.	cum. cir.	cloudy.	cumuli.
8		,903	,928	0,980	79,4	5,4	3,6	96		,784	,640	1,144	84,0	10,8	9,6	86	67,8	88,8		E.	sw.	se.	cumulus.	nimbus.	overcast.
9		,904	,878	1,026	80,2	5,1	4,6	96	29,700	,765	,596	1,169	84,2	8,9	8,6	89	70,2	93,0		W.	sw.	se.	do	cumuli.	cum. cir.
10		,858	,880	0,978	80,9	5,8	6,0	93		,739	,524	1,215	85,7	10,2	8,7	89	69,5	93,1		S.	W.	sw.	cum. cir.	cum. cir.	fine.
11		,852	,828	1,024	80,2	5,2	4,3	95		,743	,400	1,343	88,0	24,9	17,8	66	71,3	101,5		n.	W.	w.	clear.	fine.	do
12	29,804	,837	,710	1,127	82,5	10,4	10,6	82		,713	,321	1,392	89,0	21,6	21,5	56	70,2	100,8		sw.	sw.	sw.	do	clear.	do
13		,835			83,0	6,3				,690			89,5	21,2			66,0	98,7		o.	o.	o.	do	do	do
14	,783	,819	,670	1,149	82,5	18,9	18,7	64		,710	,272	1,438	89,5	23,5	24,0	52	65,9	101,2		o.	sw.	sw.	do	do	clear.
15										,769			91,2	20,9			65,7	101,0		n.	sw.	n.	do	do	do
16	,873	,899	,823	1,076	82,0	4,0	3,6	97	,750	,790			86,1	14,6	12,5		68,9	95,7		s.	e.	o.	mist.	do	do
17	,886	,915	,847	1,068	82,1	4,0	3,4	98	,736	,786	,530	1,256	86,2	8,7	9,0	87	71,0	94,2		sw.	w.	se.	stratus.	hazy.	misty.
18	,854	,890	,832	1,058	81,8	3,9	3,9	96	,717	,759	,534	1,225	85,6	9,5	9,3	87	73,5	92,1		s.	W.	sw.	mist.	do	do
19	,881	,929	,864	1,065	81,9	4,6	4,2	96	,756	,798	,611	1,187	84,6	8,0	7,6	90	70,0	90,2		nw.	w.	sw.	cum. cir.	dull.	do
20		,965			77,1	2,9				,815			83,1	19,6			69,5	88,9		o.	nw.	w.	haze	cloudy.	cloudy.
21	,949	,997	,909	1,088	80,7	8,5	8,6	80	,778	,819	,729	1,090	82,3	11,5	10,0	82	67,1	85,5	0,10	ne.	ne.	ne.	do	do	showery.
22	,906	,956	,026	0,930	78,5	5,9	4,4	94	,779	,813	,808	1,005	79,8	9,5	8,6	85	65,2	84,7		o.	n.	nw.	cum. cir.	do	cum. cir.
23	,921	,954	,947	1,007	79,3	6,8	6,0	92	,759	,802	,697	1,105	82,0	14,1	14,0	68	64,2	91,8	0,35	o.	n.	e.	clear.	overcast.	hur. at 8 p.m.
24	,957	,994	,112	0,882	76,6		6,0	88	,822	,861	,865	0,996	79,3	9,8	9,0	80	57,2	88,8		o.	o.	o.	nwr. rain.	do	misty.
25	,987	,019	,058	0,961	78,3	5,8	5,6	91	,854	,896	,829	1,067	81,3	10,6	9,2	81	59,7	91,5		NE.	W.	se.	stratus.	cum. cir.	cum. cir.
26		,011			69,2	6,1				,876			76,1	18,5			60,0	86,3	0,30	o.	se.	n.	rain.	rain.	fine.
27	,919	,948			77 3	10,9				,843			81,2	15,1			58,7	89,3		o.	o.	o.	clear.	fine.	do
28	,933	,948	,978	0,970	78,9	5,9	4,8	94	,772	,811	,663	1,143	83,4	12,1	10,0	83	65,8			n.	w.	se.	do	do	do
29	,840	,964	,932	1,032	80,1	7,0	6,3	92	,781	,821	,606	1,215	85,3	12,2	12,0	79				s.	sw.	sw.	do	do	do
30	,790	,863	,816	1,047	80,2	8,2	7,8	88	,705	,734	,476	1,258	86,1	16,6	16,7	65		99,6		s.	sw.	sw.	do	do	clear.
31		,821	,690	1,131	82,7	15,0	15,0	66	,692	,731	,488	1,243	86,1	14,6	16,0	63	70,4	115,2		s.	sw.	se.	fog.	do	fine.
Mean,		,920	28,893	1,019	79,1	7,1	6,4	90		,787	,612	1,171	83,9	14,8	12,3	77	66,0	93,7	0,75	variable.			frequent squalls.		

By "new standard Barometer" is to be understood the instrument lately received from London, made by Newman, as a duplicate of the Royal Society's Barometer; the tube has a bore of 0.587 inch, and the adjustment of the level of the cistern is perfect. As will be seen, however, by comparing its indications with those of my former standard or compensation Barometer (described in the 2nd vol. of the Journal), the new Barometer, contrary to expectation, stands .035 *lower* at 10 A. M. and .039 *lower* at 4 P. M.—This is after applying the correction for temperature, ($t-32 \times .003$ at Bar. 30 inches.)

A hurricane on the 23rd at night; most severe 30 miles N. of Calcutta, where very many boats were wrecked.

Section of St Peter's Church, Fort William.



0 5 0 10 20 30 40 50 Feet

References

a Foundation of masonry to sustain the stress of the Shores
b Foundation beam
cc Uprights fitting the moulding of the Pillars
d Straining beam
ee Struts
f Straining Sill
g g Moveable centre supporting the aisle Vaults under demolition
k Section of a suspension platform from which the workmen were able to demolish the Nave vault in security
l The suspension ropes fastened to the towers
r Beams to which the punkahs were suspended
s Holes made in the pillars and buttresses for the reception of the punkah beams
t Portions of the pillars broken off in consequence of the insertion of the punkah beams

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 52.—April, 1836.

I.—*Account of the Mountain Tribes on the Extreme N. E. Frontier of Bengal. By* J. McCosh, *Civil Assistant Surgeon, Goálpára.*

[Read at the meeting of the 4th Nov. 1835]

The following pages have been compiled from original manuscripts lately put into my hands by Captain Jenkins, Agent to the Governor General on the N. E. Frontier, with kind permission to make what use of them I thought proper. Some of these letters were written from his own personal observation; others by Major White, Political Agent for Assam; as also by Mr. Bruce, commanding the Gun Boats at Suddia, so that the information contained in this digest may be relied upon. From the lively interest lately taken in the regions hereafter described, on account of tea growing there indigenously, and the probability of their speedily assuming an important aspect in the statistics of India, any facts concerning such districts will, I hope, prove not uninteresting to the public.

Few nations bordering upon the British dominions in India are less generally known than those inhabiting the extreme N. E. Frontier of Bengal; and yet, in a commercial, a statistical, or a political point of view, no country is more important. There our territory of Assam is situated in almost immediate contact with the empires of China and Ava, being separated from each by a narrow belt of mountainous country, possessed by barbarous tribes of independent savages, and capable of being crossed over in the present state of communication in 10 or 12 days. From this mountain range, navigable branches of the great rivers of Nankin, of Cambodia, of Martaban, of Ava, and of Assam derive their

origin, and appear designed by nature as the great highways of commerce between the nations of Ultra Gangetic Asia. In that quarter, our formidable neighbours, the Burmese, have been accustomed to make their inroad into Assam; there, in the event of hostilities, they are certain to attempt it again; and there, in case of its ever becoming necessary to take vengeance on the Chinese, an armed force embarking on the *Brahmaputra* could be speedily marched across the intervening country to the banks of the greatest river of China, which would conduct them through the very centre of the celestial empire to the ocean.

This beautiful tract of country, though thinly populated by straggling hordes of slowly procreating barbarians, and allowed to lie profitless in primeval jungle, or run to waste with luxuriance of vegetation, enjoys all the qualities requisite for rendering it one of the finest in the world. Its climate is cold, healthy, and congenial to European constitutions; its numerous crystal streams abound in gold dust, and masses of the solid metal: its mountains are pregnant with precious stones and silver; its atmosphere is perfumed with tea growing wild and luxuriantly; and its soil is so well adapted to all kinds of agricultural purposes, that it might be converted into one continued garden of silk, and cotton, and coffee, and sugar, and tea, over an extent of many thousand miles.

This valuable tract of country is inhabited by various races, several of which have acknowledged our authority, some that of the Burmese, and others that of China; but a considerable number have sworn allegiance to no power; and maintain their independence. Of these tribes the most considerable are the Míris, Abors, Mishmís, Kangtis, Bor-Kangtis, Singphos, Muamárias, and Nágas.

Míris.

The Míris occupy that stripe of alluvial land along the northern bank of the Brahmaputra, from the large island Majuli (the extreme boundary of the present Rájah of Assam), to the river Dihong the northern branch of the Brahmaputra; and are bounded on the north by the hill country of the Abors. Till of late years, this district was deserted on account of the ravages of the Abors; but on our affording them protection, the original inhabitants have returned. The land is still very thinly populated, and the only cultivation is along the banks of the great river. Their head village is Motgaon. The manners and habits of the Míris are wild and barbarous, their persons filthy and squalid; they use a language different from the Assamese, and make use of bows and poisoned arrows as a defence against their enemies. They are expert marksmen; and the poison used is so

fatal, that even a scratch of their arrow is followed with certain death. They eat all sorts of wild animals, not excepting those killed by their own poisonous arrows.

The Míris are an industrious race, and partial to living in the skirts of the forests, clearing new ground, which they cultivate for a year or two, and then move off to another place, when the soil is exhausted. A great deal of opium is grown by the Míris, which they barter for grain with the Assamese.

Abors and Mishmis.

These tribes inhabit an extensive range of mountainous country along the southern exposure of the great Himálaya chain, from the 94th to the 97th degrees of E. longitude, and border with Thibet and China. It is difficult to form a conception of the extent of these tribes, but they are not to be despised; for during the insurrection of the Muamárias, no less than 17,000 Abors joined to drive that tribe out of Assam. It is probable that at no ancient period these two tribes were unconnected, but the Mishmís are now considered by the Abors as dependent upon them, and treated as slaves. Besides the Mishmís here mentioned as subservient to the Abors, there are several other tribes of them; such as Muzú-Mishmís and Taen-Mishmís, inhabiting the extreme branches of the Lohit or eastern channel of the Brahmaputra, who are probably independent. These tribes possess one of the lowest grades of civilization; they occupy numerous villages along the precipitous shores of the two great northern branches of the Brahmaputra, the Dihong or Sampo, and the Dibong. Their houses are so constructed, that the perpendicular side of the rock forms one wall: the floor is made of bambus, with one side supported on the rock, and the other on beams driven into the ground. The space underneath is inhabited by the cattle, and the interstices in the floor afford the double advantage of showering down all the offal to the herd below, and preventing the accumulation of filth and nastiness.

Hospitality.—Though the snows of their mountain home have narrowed their means of subsistence, and limited their intercourse to their immediate neighbours, yet they are a hospitable and even a social race; and a constant round of festivity is kept up from one end of the year to the other. Each chieftain kills the fatted bullock in turn; all his associates are invited to partake of the good cheer: the host is in his turn a guest at the next feast; and thus a reciprocity of entertainment is insured. Nor are these hospitable rites allowed to be forgotten; the scull of every animal that has graced the board, is hung up as a record in the hall of the entertainer; he who has the best stocked

Golgotha, is looked upon as the man of the greatest wealth and liberality; and when he dies, the whole smoke-dried collection of many years is piled upon his grave as a monument of his riches, and a memorial of his worth.

Migration.—These people, accustomed to a temperature at and about the freezing point, seem to dread an exposure to the heat of the low countries during the summer, and make their descent to their markets at Suddia only in the cold weather, and take their departure to their snows as soon as the *Simala* tree puts forth its blossoms.

Trade.—They bring along with them a few bags of musk, and musk-deer skins; some ivory; a few copper pots, which they obtain from the same country; and a considerable quantity of a vegetable poison called *Bis-Bisá*, used in poisoning arrows. These they exchange for glass beads, of which they are very fond, and cattle, for the purpose of eating. The musk is for the most part adulterated; a portion of the genuine musk being abstracted to make into artificial bags, and its place filled up with dried blood.

Poison.—The poison is of a very superior quality, and is in great request by all the neighbouring nations for destroying wild animals. It is contained in a small fibrous root, which they tie up into little bundles. It is prepared by pounding the root to powder, and mixing it up with the juice of the *Otenga* tree, to give it tenacity, and make it adhere to the arrow head. They keep the plant a great secret, and take the effectual precaution of boiling it before leaving their homes, so as to destroy all possibility of its being propagated.

Road to Thibet.—The route to Thibet, adopted by pilgrims, leads through the Abor country, along the course of the Dihong or Sampu, and is accomplished in sixteen days from Suddia. The route, as mentioned by Mr. Bruce, is as follows:

From *Saddia* to *Kaj-jin*, five days' journey; thence to *Lak-qui*, one day; *Gha-lum*, one day; *Ma-ma-nu*, one day; *Dullá*, one day; *Omono*, one day; *Hullí*, one day; *Sum-lay*, one day; *Hán-nay*, one day; *Kum-day*, one day; *Rí-sháh*, one day; *Bhá-lu*, one day. *Bhálu* is the frontier town of Thibet. About four days' journey beyond it stands the city of *Ro-shí-máh*, containing fine buildings, and a large civilized population, and a government purely Chinese.

The Grand Lama himself, and all head officers throughout Thibet, are appointed by the Emperor of China, and receive allowances from the Chinese government. The chief of Suddia seems to have considerable influence with the Thibetans, and the intermediate hill tribes. Almost all pilgrims apply to him for a passport, and he is in the habit

of sending an escort with them as far as Ma-ma-nu, whence they are passed along from one tribe to another till they arrive in the country of the Grand Lama. There is another route into Thibet viâ Brahma-kúnd, through the country of the Mishmís; but it is at all seasons of the year covered with snow. There is but little trade now carried on with Thibet, and that little is chiefly effected by pilgrims. The few things imported are smoking pipes of Chinese manufacture, woollens, and rock salt. In exchange for these they give musk, ivory, and *Bisá* poison. Assamese captives at one time formed a considerable trade; but since these latter came under the protection of the British, that lucrative branch has been exterminated.

During the flourishing period of the Assam dynasty, we are informed*, that the kings of Assam were in the habit of sending presents to the Grand Lama, and that a caravan consisting of about 20 people annually resorted from Lassa to the Assam frontier, and transacted merchandise to a very considerable amount with the Assamese. The Thibetans took up their quarters at a place called Chouna, two months journey from Lassa: and the Assamese, at Geganshur, a few miles distant from it. The trade of the former consisted of silver in bullion to nearly a lakh of rupees, and a large quantity of rock salt. This they exchanged with the Assamese for rice, silk, lac, and other produce of Bengal; but this trade has for many years been discontinued.

Kangtis.

The Kangtis, the most civilized of all these mountain tribes, inhabit that triangular tract of country bounded by the Lohit on the one side, by the Dibong on the other, and by the mountainous country belonging to the Mishmís on the third. They are descended from the Bor-Kangtis, a powerful race situated on the sources of the Irawadí. About 50 or 60 years ago, they emigrated from their native country, and availing themselves of the civil war then raging throughout Assam, they took forcible possession of the country they now enjoy, ejected the reigning chieftain, the Suddia Cowa Gohaing; and the Kangti chief, usurping his name and jurisdiction, reduced his subjects to dependence or slavery. The Kangtis, by a vigorous mode of government, and holding out an asylum to refugees from other states, soon rose to eminence. They are now a superior race to all their neighbours; they are tall, fair, and handsome, considerably advanced in civilization, and are endowed with no small share of military courage. Their religion is Buddhism; but Hinduism is gaining progress. They are amongst the few tribes who have a written character, and can read and write the Burmese language, and understand it when spoken.

* Hamilton's Gazetteer.

Their own language, though written in a character a good deal resembling the Burmese, is quite different, and closely resembles the original Ahom. Every boy is taught to read and write it, by the priests. Suddia is the capital of the Kangti country, and the chieftain is known by the name of the Suddia Cowa Gohaing, and claims descent from the royal family of Assam.

Suddia is situated on the right bank of the Kunil or Kundil nallah, and about six miles above its junction with the Lohit. It is a place of some importance, and has a population of about 4000 men, exclusive of women and children. Its trade is rapidly increasing; all the necessaries of life are procurable: its exports are gold and silver; amber, musk, and ivory; Kampti daus, Chinese and Burmese trinkets; Bisá poison, and dye-stuffs, called Mishmí-títa and manjít. The Mishmí-títa, manjít, and lime, triturated with water, and allowed to digest in an earthen pot for a month, makes a beautiful permanent red dye. The daus are of a high order, and are so much prized as to bring 12 Rs. a piece. They are manufactured by a rude wild race, called Kunungs, (slaves to the Kangtis,) who are situated on the extreme branches of the Irawadí, who can neither read nor write, and are little removed above the brutes.

Suddia station.—The country around Suddia is composed of the richest alluvial soil, well adapted for cultivation; but is generally flat and liable to inundation. A large portion of it is waste, and overgrown with jungle: it is closely surrounded by the snowy mountains, which are only about thirty miles distant; and the water of the river is so cold, that of itself it serves to cool wine for table.

Force.—Suddia is the most advanced post we possess on the N. E. Frontier. Three companies of the Assam Light Infantry are stationed there, under the command of a European officer, invested with political authority. Two gun-boats are also stationed there, also under the command of a European: each boat has one 12-pr. mounted on slides, and is well manned and equipped for service: one of the boats is manned by Kangtis, who give much satisfaction. There is also a small stockade erected, with a few guns mounted. Suddia has hitherto preserved a healthy character. It is likely soon to become the head-quarters of the Assam Infantry. The Suddia Cowa Gohaing, though he pays Government no tribute, acknowledges the Company's supremacy, and is bound to furnish a contingent of 200 men. That contingent is supplied by arms and ammunition at the expense of Government; they are drilled by the Subadar of the Assam Light Infantry, four months in the year, and the arms, when in want of repair, are forwarded to head-quarters at Bishnath.

The Suddia Cowa Gohaing is believed to be a firm friend of Chandra Kant's, the ex-rájah of Assam; when formerly driven from the kingdom, the Suddia Cowa had influence enough at the court of Ava to obtain the assistance of the Burmese to restore him to his throne; and now that Chandra Kant is again deposed, he is thought to be constantly intriguing to have him again placed on the throne.

Bor-Kangtis.

The Bor-Kangtis are a numerous and powerful race, situated amongst the mountains whence the Irawadí takes it origin. They are under the government of Ava, and supply a contingency to the Burmese army. Experienced Burmese officers are constantly traversing their country, for the purpose of drilling them, and inspecting their arms and ammunition. The capital of the Bor-Kangtis is Manchí, on a remote branch of the Irawadí. This place was visited by Lieuts. Wilcox and Burlton in 1827, by an overland route, cut across the mountains from Suddia. The journey occupied about 12 days: they were kindly received by the Bor-Kangti chief, who gave them every information about the sources of the Irawadí, and convinced them that from the smallness of the streams, it was impossible for any of them to afford a channel for the waters of the Sampu. The main stream of the Irawadí is there fordable, and not more than 80 yards broad.

There is a silver mine in the Bor-Kangti country; but it has never produced more than 8000 rupees a year. It might be turned to much more advantage; but the possessors are afraid of increasing its revenue, lest by doing so, they should excite the avarice of their neighbours. There are also mines of lead and iron in this country.

Múnglung Kangtis.

We have lately come into intimate contact with another tribe of Kangtis called Múnglung: these from dissension amongst themselves, and from the oppression of the Burmese, have lately dispatched about 200 of their tribe to stipulate for settlements in the British dominions, and report on the prospect of the country around Suddia. Should their report prove favourable, about 5000 more have expressed their desire to emigrate.

Singphos.

By far the most powerful and the most formidable of these hill tribes are the Singphos; they are also the most numerous, and are scattered over the greatest extent of country. They are bounded on the north by the Lohit river; on the east by the Langtan mountains, which separate them from the Bor-Kangtis; on the south by the Patkoí range, which divides them from the Burmese Singphos, from whom they are descended; and on the west, by a line drawn south from Suddia, till it meets the last mentioned mountains.

The Singphos are divided into 12 tribes, each having its own chief or Gaum ; but every chieftain maintains his own separate independence, and seldom unites with any other, unless it be to punish some aspiring chief obnoxious to them all, or in making plundering excursions upon neighbouring states. The Singphos have for several generations been the terror of the wretched and degenerate Assamese, and were in the constant habit of making irruptions into their country, sometimes as far as their very capital itself; of plundering their temples, laying waste their country, and carrying off the inhabitants into slavery. Since the British troops have had possession of Assam, these inroads have been prevented; but as might be expected, they are somewhat impatient of that restraint, and have once or twice endeavoured to resort to their old habits.

To give an idea of the extent to which the devastations were carried on, the late Captain NEUFVILLE, received from the Singphos alone upwards of 7000 Assamese captive slaves, and perhaps there are 100,000 Assamese and Manipurís still in slavery throughout the dominions of Ava.

About five years ago, a body of them amounting to about 3000 men, armed with spears, daus, and a few musquets and jinjals, under a chief called WAKUM KOONJIE, made an advance against the station of Suddia, with the confident intention of carying away in chains every seapoy present, and of driving the British out of the country. This was a plot of three years' concocting ; large stores of grain were accumulated in convenient depôts, and shackles for 10,000 prisoners were all in readiness; but the whole force was shamefully repulsed by the then political Agent, Capt. NEUFVILLE, at the head of a handful of men of the Assam Infantry, and a few armed Kangti and Muamária militia, and driven in consternation into their lines.

The Lubona only of all the 12 chiefs took part in this irruption, and he has taken an active hand in the late disturbances, headed by the Duffa Gaum.

All the chiefs have claimed our protection, though no tribute is exacted from them; with one or two exceptions, they have acted up to their engagements.

The Busa Gaum or chief is a man of superior understanding, and was entrusted by the late Agent to the Governor General, the lamented Mr. SCOTT, with a good deal of confidence, and had an allowance from Government of 50 rs. a month, as an organ of communication with the other chiefs, and a spy upon their actions. The late Capt. NEUFVILLE was also confident in his integrity, and made proposals to him to desert his own country, and live on lands to be granted him at Burhath and

Jaipur, and allow his native hills to become a wilderness, and form a natural barrier against the incursions of the other tribes.

The population of the Busa Gaum is about 9 or 10,000 men, exclusive of women and children. He furnishes a contingent of about 100 men, and is supplied with arms and ammunition.

The most influential of the unfriendly chiefs is the Duffa Gaum. Only a few months ago he made a hostile incursion against our ally the Busa Gaum, and massacred every man, woman, and child he could get near; the Busa Gaum narrowly escaped with his life, and some of his own family were cut to pieces. After two or three skirmishes, the marauders were dislodged, and driven to their hills, by the force at Saddia; but the Duffa, instead of repenting of his atrocious act, and retiring to his home to await the consequences, commenced playing the despot in another quarter, threatening every one with his vengeance who acknowledged British protection, and even beheaded some who refused to conform to his will. By the latest accounts, the state of affairs in that district were very troublesome, and the whole of the Assam Infantry disposable are already on the move for its protection.

A feud has for a long time existed between the Busa and the Duffa Gaums, and the inroad lately made by the latter admits of some palliation, as it avenged a similar one formerly made by the Busa Gaum.

Rude as is the state of society amongst the Singphos, they are not without the distinction of caste; but are divided into Thengaís, Myyungs, Lubrungs, and Mírups.

They have no religion properly their own, but have patched up a creed from amongst the superstitions of all their neighbours, and decorated their rude temples with ruder idols of all religions.

The Singphos are not a branch of the Shán tribes: tradition traces their origin to the confines of China or Thibet: the language is entirely different from that of the Sháns, and is unwritten.

Polygamy is patronised, and every man keeps as many wives as he chooses, free women or slaves; and treats the offspring of both without partiality. Infanticide in all its shapes they abhor.

It is the custom of the country to bury the dead. Those of the poorer classes are interred soon after death; but the chiefs and principal individuals are sometimes not buried for years. The reason alleged for this consummation of the funeral rites, is to allow the widely scattered relations of the deceased to have time to attend, who would not fail to take deadly offence at their not being allowed an opportunity of paying reverence to the ashes of the head of their family. Not knowing the art of embalming, the body after death is removed to a distance from any habitation, till decomposition is completed.

After that it is deposited in a coffin, and conveyed to the house of the deceased chief, where it lies in state, surrounded with all the insignia the illustrious individual enjoyed when alive. When all the relatives have assembled, or communicated their not being able to attend, the coffin is committed to the earth, and a mound of clay, surrounded with a curious trellis-work of bambus, is raised to his memory. If the person has died a violent death, a buffalo is sacrificed as a propitiation to their deities, and the head is fixed to a cross, and placed near the grave; but if he has died in the course of nature, no sacrifice is considered necessary.

According to the law of inheritance, the patrimony is divided between the eldest and the youngest son; while any children that may intervene are left to push their own fortunes as they best can. The eldest son succeeds to the title and the estate, while the younger, carrying away all the personal and movable property, goes in quest of a settlement for himself.

Tea.—The tea tree grows wild all over the Singpho country, as also upon all the hills in that part of the country, and is in general use by the natives as a wholesome beverage. The tea tree, according to Mr. Bruce, was known to be indigenous to these climates about ten years ago; and during the Burmese war, large quantities of it were sent into Saddia by the Busa Gaum. How long the subject might have lain dormant is doubtful, had not the affair been again brought to the serious notice of Government, at a time the most favourable for doing so, by the scientific investigations of Capt. Jenkins and Lieut. Charleton of the Assam Infantry, to whom we must acknowledge ourselves indebted for a revival of its existence, and for the boon it must necessarily confer upon our country*.

Mr. Bruce has lately been on a tour to the Singphos, and mixed in social intercourse with them. He saw many thousands of the trees growing in their native soils, and brought away some plants and specimens of the leaves and seeds. The trees were of a very considerable size, so as to merit a higher rate of classification than a plant or a shrub: he measured one of the largest, and found it 29 cubits long, and about four spans in circumference at the base.

Mr. Bruce mentions the following as the native process of making tea, though he does not seem to have witnessed it. First, the leaves are collected from the tree, and put into large boilers containing water. As soon as the water boils, the decoction is drawn off, and

* This paper was written before the appointment of the scientific deputation to the tea districts, whose report may be now shortly expected.—Ed.

thrown away, and the leaves, being taken out of the boiler, are put into a pit dug into the ground, and lined with some sort of leaves, to prevent the tea coming in contact with the earth. When the pit is filled with tea leaves, it is then spread well over with a thick layer of the other leaves, and after all, covered over with earth, so as to exclude all air. In this state it is allowed to remain for two or three months, when the pit is opened, and the tea sold on the spot to traders, who pack it closely up in the joints of bambus, earthen pots, &c. and transport it to other parts of the couutry on mules for sale. He also mentions, that many thousand maunds of tea are manufactured at a place called Polong, and exported to China. Where Polong is situated, I have not been able to determine.

In addition to the tea tree, the Singpho country has lately been discovered to abound in many valuable gums, well adapted for varnishes.

Burmese Singphos.—The Singphos of Assam are separated from the Singphos subservient to the Burmese, by the Patkoí chain of mountains; and though these two races are entirely unconnected with one another, and independent, yet a constant friendly intercourse is maintained between them. The Burmese Singphos occupy a very extensive tract of country on both sides of the Irawadí, and from the Patkoí mountains eastward to the borders of China.

Trade with China.—As the Chinese carry on a very considerable trade with these Singphos, and through the medium of their country with Assam, I shall endeavour to mark out particularly the line of communication between the two countries. The Chinese province of Yunan being separated from a navigable channel of the Irawadí, only by a mountain chain, inhabited by Sháns, tributary to Burmah, the Chinese merchants, by a short land journey across these mountains, convey their merchandise on mules, to a place called Catmow, on the banks of that river. There the Irawadí is a large stream. The channel is unincumbered with rocks, trees, or sandbanks; the shores are composed of a stiff hard clay, not liable to tumble down, and present every facility for navigation. The exact position of Catmow seems undefined. The merchants, having loaded their goods on boats, easily procurable, commit themselves to the gentle current, dropping down with the tide due south, day and night, and on the third or fourth day arrive at the mouth of the river called Nam-yang. After ascending this river four or five days in a north-west direction, they come to a town called Mung-kung, or Mugaum, the chief depôt of Chinese trade situated at the junction of two smaller rivers, the one called Nam-kung, or the Mugaum river, the other, Nam-yang,

retaining the name of the united stream. The Mugaum river is navigable for 40 or 50 miles above the town, and for small canoes, a good deal farther, and extends in a northern direction. The Chinese wares are transported up this river as far as practicable, and afterwards conveyed overland through Hukung and Busa to Assam. The journey from Mung-kung to Assam occupies from 15 to 20 days.

Route into China.—There are two other routes to China besides the one mentioned, the one by a place called Senwa, and the other by May-nay, both of which run direct into Burmah, but little more is known about them than their name. The intercourse between China and Assam by any of these roads is extremely tedious, and can only be followed by a trading people, who traffic as they move along, without regard to time or distance. A knowledge of the extreme navigable eastern branches of the Brahmaputra has pointed out a much shorter and more convenient pass, and this was travelled by Lieuts. WILCOX and BURLTON on their visit to the Bor-Kangtis. Following up the river Noá Dihing, which flows into the left bank of the Lohit, a few miles above Suddia, they were able to proceed by water conveyance to within nine days' journey of Mung-lang, on the banks of the Irawadí, and without experiencing any serious difficulty or inconvenience farther than the jungly state of the country.

Importance of a Road.—A road passable even for mules or oxen between the navigable branches of the Noá Dihing and the Irawadí could not fail to be of great national benefit, and would open a channel for the direct importation of all the valuable productions of Central Asia. It would also tend to the complete civilization of the savage mountaineers, who inhabit these regions, and enable a force to penetrate into the centre of the country, whither they can at present retreat with comparative impunity. It is doubtful how far those tribes would contribute to the formation of roads, or the furtherance of any attempt on our part, to extend our intercourse into the interior; they have hitherto been jealous of any encroachment, and not many years ago, gave proofs of the spirit by murdering the individuals who conducted Lieut. BENNETT to the Patkoí boundary.

But the time, it is to be hoped, has already arrived when these fertile tracts will be taken under our especial protection; when the untutored barbarian must submit to civilization and improvement, and his wilds and his wastes to the ploughshare and the hoe of British agriculture.

The most important articles of trade exported by the Chinese from the Singpho country are gold dust, precious stones of various colours, and ivory.

Gold Dust.—The gold dust is procurable from most of the streams

of the Brahmaputra; but the gathering it is but a poor trade, and is now but little followed. The place most celebrated for its precious stones is Mung-kung or Mogaum.

Precious Stones.—On a range of hills near it, a great number of deep mines are dug, and the working of them affords occupation for many thousand inhabitants. When a stone of moderate weight is found, it is hoisted to the mouth of the shaft by a windlass erected for the purpose. But they frequently meet with large masses, which they have not the power of moving: these they contrive to break to pieces.

Mining.—The workmen begin by kindling a strong fire all over and around the precious stones, till it is well heated; they then mark off with some powerful liquid, the piece they wish to break off, a large stone is suspended from the top of the shaft perpendicularly over the piece to be broken off, and when all is ready, the stone is cut away, and falling with great impetus upon the mass below, breaks off the fragment exactly according to the line drawn with the liquid. It is difficult to account for this mysterious liquid being able to prevent the whole mass from being splintered, and how it should preserve such a line of separation; yet such is the native belief, and it is not improbable that its effect is merely imaginary, or that is practised from some superstition.

These stones are afterwards cut into convenient pieces by means of a bambu bow with a string of twisted wire, the string being applied to the stone and used as a saw, while its action is assisted by some sort of pulverized mineral*. As might be expected, much bloodshed is frequently the consequence of finding these hidden treasures. When any doubt arises about the party who first discovered one, or about the right of possession, bloody battles ensue with short swords in hand between whole villages. Large emeralds are allowed to lie around the pits unclaimed by any one: no one venturing to carry them away, lest every one should fall upon them in vengeance. These precious stones are afterwards carried on mules to China, and are sold at very high prices, some of them bringing 7 or 800 seers weight of silver. The Burmese governor levies a tax of two seers on every 10 that are exported. These mules are driven along in gangs of 20 to 30; the drivers go armed with swords and matchlocks, and guide their beasts of burden by word of mouth. The route they pursue to China is viâ Catmow or the Irawadí, and the overland journey from Mung-kúng to Catmow occupies about nine days.

Amber.—Besides the mines of precious stones, there are several amber mines in the province of Hukúng, which are wrought to con-

* Doubtless corundum: this is the common mode of cutting hard stones.—Ed.

siderable advantage. The amber is cut into cylinders about ¼ inch in diameter, and two inches long, and is worn as an ornament stuck through a hole in the lobe of the ear, both by Assamese and Burmese.

Ivory.—A large quantity of ivory is exported by the China merchants. It is almost all obtained by the Singphos, from shooting the wild elephants with poisoned arrows fired from a loaded musket. When once they get upon the tract of a herd, they continue the pursuit for days together, taking up favourable positions upon trees, or lying in wait in the long grass, till they can take a fatal aim. Vast numbers of these noble animals are destroyed in this manner, both by the Singphos and Kangtis; they are as susceptible to the fatal effects of poison as the smaller animals, and fall down dead immediately after being slightly wounded. Their teeth are struck out by the hunters, and the carcasses are left to be devoured by the beasts of prey.

Chinese returns.—In return for these valuable commodities, the Chinese bring into the Singpho country, nankins, silks, lacquered and China ware, lead, copper, and particularly silver.

A great portion of the silver that comes into Assam through the Singphos is stamped with Chinese characters. It can scarcely be called a coin, but a piece of bullion; and appears to have been made by scooping out a small round hole in a piece of clay, then filling it with molten silver, and before it becomes cold, impressing it with the Chinese stamp. Not two of these lumps of silver are of the same value or size: their intrinsic worth is ascertained by their weight, and is found to vary from two to 10 rupees.

Bullion.—Though the metal is very pure, it is called *kacha rupa*, and one sicca weight of it is fixed as equal to only half a sicca of the properly coined metal. No inconvenience arises in purchasing articles of small value; the hill tribes take out their dau, and chop it into pieces even to the portion of a pice. This *kacha rupa* is eagerly purchased by the chiefs in Upper Asam, who, after adulterating it largely, cast it into their own coin, and thus realize an enormous profit. These chiefs have most of them mints of their own, and are in the habit of coining rupees for any one who will give them the raw material, retaining only 10 per cent. for their trouble.

Muamárias or Mattuks.

The country of this tribe is bounded on the N. by the Brahmaputra, on the S. by the Burí Dihing; on the E. by a line drawn S. from the mouth of the Kunili nallah to the Burí Dihing, and on the W. by a line drawn from the mouth of the river Dibunu to the Burí Dihing. About 1793, these people rose in arms against the reigning Rájah GOURINATH SINH, and after many bloody engagements with the royal

troops, at last succeeded in driving him from his throne and kingdom, and in appointing a successor of their own choice. During the period of their ascendancy, they committed the most dreadful ravages upon the country, and the original inhabitants: great portions of it were deserted, and even till this day, it has never regained any thing near its former prosperity. But these lawless plunderers were not allowed long to enjoy the fruits of their conquests; they were speedily driven from the capital by 1000 sipáhís, under Captain Welsh, and retreated to the districts which they now inherit. The head of this still powerful clan is known by the name of the Mattuk Rájah, or more commonly, by that of the *Bara sènapatí* (great general). During the Burmese war, he maintained his independence; but on our taking Rangpur, he claimed our protection, and has since manifested his sincerity, by a zealous endeavour to render every assistance in his power in the advancement of our plans.

The greater part of the country allotted them is a desert waste, and only the banks of the river Diburí are inhabited. The population amounts to about 60,000 men, inclusive of women and children. The capital is Rangagora. The state is allowed about 500 musquets and ammunition according to treaty, and supplies a large contingent. They profess the Hindu religion; but act so little in accordance with its tenets, that enlightened Brahmins scarcely acknowledge them.

The *Bara senapatí*, with all his affability and apparent deference to our authority, is by some considered not entitled to perfect and unlimited confidence. Situated between two powerful states, the British and the Burmah, his policy seem to be to maintain good terms with both; and in the event of another Burmese invasion, it is to be feared, he would preserve neutrality, till he saw how the scale was likely to turn, and then join the stronger party.

Nágas.

The next border tribes met with in proceeding westward are the Nágas. To assign limit to their country seems almost impossible, and even to number their numerous tribes, no less so; they are scattered all over the mountainous ridge that divides Assam from Manipur, to which state some of them are tributary, some to Assam, and some even to the Burmese. There is no one individual tribe of any formidable consequence amongst them, and there is but little inclination to coalesce, they being constantly embroiled in petty feuds. Their houses are built on the most inaccessible points of the mountain, and planned for every-day defence. They are represented by the inhabitants of the plains as robbers and murderers, and are so much the dread of all, that little of their economy is known.

Brine Spring.—One of the most remarkable circumstances relating to their country is the number of brine or salt springs in many parts of it.

At Burhath, on the river Disung, there are about 20 of these brine springs, from most of which the Nágas are in the habit of making salt. These wells are dug to a considerable depth, and the brine varies in intensity, probably according to the access of fresh water from the surface; and being situated in a valley, and having no protection from the rain, they are generally filled in the wet season. The consequence is, that the manufacture is carried on only in the cold weather.

Manufacture of Salt.—Some of the best of these wells give 10 sicca weight of dry salt to the seer of water, and others, only three or four. The process of evaporation is carried on by filling the joints of large bambus with brine and suspending them in an earthen trough, filled with water, which answer for the purpose of a boiler, and in this rude way, the brine in the bambús is evaporated, till salt is formed. These mud troughs are every season broken down, and being triturated with water, afford a strong brine from which other salt is formed.

So tedious and unskilful is the manufacture, that the salt made from these wells cannot be made at less price than the same quantity of salt transported from Bengal.

II.—*On the Method employed to remove the Vaulted Roof of St. Peter's Church in Fort William, illustrated by a Section, (Plate V.)*

Works of engineering skill come peculiarly within the limits pointed out by the motto on our title page, as fitted for the Researches of a Scientific Society or Journal: "The performances of man," of such a class in this country, and under British rule, are, it is true, but rare and trifling compared with the noble efforts of art, which grow up from day to day under the eye of an observer in Europe. There, letting alone tunnels and railways of gigantic enterprize, we hear of half an elliptic arch sprung by the celebrated BRUNEL from a buttress and carried to a semi-span of *seventy feet, without centering*, by the mere adhesion of the cement!—of an iron suspension bridge at Fribourg in Switzerland thrown over a ravine of 170 feet deep, in a single bold span of more than 900 feet from rock to rock, far surpassing the Menai bridge, or even the designed bridge from St. Vincent's rocks at Clifton, which latter we regret to hear has been abandoned, in consequence of the riots in Bristol, and the destruction of that wealth which would have been so well bestowed upon this noble work.

We have but little indeed to bring forward in rivalry of such magnificent undertakings; howbeit, there have been schemes of vast magnitude projected, and some under a Viceroy such as Lord W. Bentinck, partial to engineering pursuits, might ere this have been put in execution. The draining of the Salt-water lake, (were it conceded to be a salutary measure) would be feasible enough. The line of wharfs or jetties on the Strand is actually planned and estimated for. The Rajmahl line of survey is a splendid specimen of mapping; and although we have no anticipation of seeing it undertaken, the results of the inquiry will, we hope, be given to the public in a volume, with all its sections, by its projector our Indian Belidor. Of architectural achievements we have less to boast. Twenty years since, money was bequeathed by a rich native for the erection of a College at Huglí, and yet nothing has been done unto this day. Are architects wanting, or are the curators anxious to appropriate the money for other purposes? We have seen more than one tasteful design, but how is an artist ever to satisfy the views of a numerous committee, not more than one or two of whom perchance have any notion of architectural propriety? In feeble imitation of the Parliamentary Church Committee at home, we have a private fund created by rupee contributions for the erection of places of worship in the interior; but it is far too poor to aim at ornament in its humble structures. The Martiniere is the only public institution, erected within the last year or two, that has real pretensions to correct taste in its exterior elevation. It is strangely disfigured by a high wall round the ground, and the arrangements of the interior have been marred by an imperfect conception at starting, of what would be required in it.

An observation forces itself upon us when viewing the noble portico of this building, of the Scotch Church, or of the mint, with their handsome flights of stone steps;—that the purity of Grecian temple architecture cannot or ought not to be preserved under the altered circumstances of the present age. Men no longer resort on foot in daily processions to the sacred vestibules of their gods. They drive in comfortable carriages, and would fain dismount under shelter from the sun and the rain. Is it not a fault of grievous magnitude then, that neither of these three buildings possesses a carriage access? and that at the Mint, for instance, bullion cannot get within 100 feet of the hall of weighment, except on coolies' heads. The Government house is in this respect better provided; but here the basement entrance has been made an eyesore, and a mere secondary object, instead of the primary one, being in constant use. The portico of the Martiniere was intended for carriages, but this object was sacrificed to the gaining of space for a play-ground, and the road

is now brought up at right angles with the foot of the steps, which has an unseemly and awkward effect.

The native architect in the palaces of the east provides not for carriages, but how suitable is the lofty arched gate with its music galleries for the train of towered elephants and horsemen issuing from the interior court. Under the sloping *chhaja* or cornice of the native dwelling, or *baithak-khúneh*, the architect inserts iron rings for the striped pavilions it is intended to bear. They look natural to it, as they are necessary to the climate; whereas how may not the Ionic façade of the Martiniere be disfigured hereafter, perhaps, by venetians run up between the columns of its fine portico, as in the left wing of the Government house, or by matted hoods gracing the southern windows of each wing?

Too much stress cannot be laid on the proper adaptation of style to the climate. The architect's duty is but half performed, if he provide not for every contingency to which his building may be subject, whether in respect to durability or to convenience; and even when the former is attended to, the latter is too frequently neglected.

A striking instance of the bad effects of inattention to apparently trivial objects of this nature is afforded in the subject of the present notice. Major HUTCHINSON designed and executed a gothic vaulted church roof in brick, the first attempted in India. He neglected to make provision for the hanging of punkahs, and upon a representation of their being wanted, the executive department, with little calculation of the disturbance of equilibrium or strength of materials, ordered holes to be cut at the head of the clustered columns, to admit beams to swing them. Had the architect at first, as he has now done, let in iron rods to sustain the punkah ropes, his work would have been uninjured, and Government have been saved double, nay triple, expenditure; and his fame have been preserved from unmerited censure. Few people in such cases calmly inquire into particulars; they ask, who raised the fabric, and upon his head lay the onus of the failure.

We are glad, with reference to this last fact, at having obtained permission to make public the report of the real circumstances given in to the Military Board in June, 1832, with its explanatory section.

It is necessary to recapitulate to such of our readers as are unacquainted with the facts, that about six years ago the vaulted roof of St. Peter's was condemned as unsafe, and was ordered to be demolished. The keystone or vertex of the central and side vaults had opened from end to end, and other dangerous symptoms were observed. Committees were held, and a variety of opinion as to the cause elicited, but the necessity of demolition was general, and Major HUTCHINSON was

intrusted with a task seemingly as difficult as the original construction, and fraught with more danger to the workmen employed.

The true nature of the case will strike every one who looks attentively at the accompanying section, namely that the cutting of the holes for the punkahs was the origin of the whole mischief. Had the cracks in the roof existed at the time, it can hardly be imagined that orders could have been issued to cut away the only props of the superstructure. The effect of such an improvident order was however fully represented at the time by Lieut. MALLOCK, Major H. being then in England.

It is probable that the chief engineer relied upon his experience of the firm tenacity of the materials: that he had good reason to do so in many respects is proved by the fact recorded in the report, that the semi vault stood firmly when the keystone was knocked out, and was with difficulty broken away piecemeal.

Hence it appears, that after all, the roof might have stood with perfect safety had the punkah holes been refilled with care, and the side-vault been braced together with light iron rods, as in the well known *Musée des Arts et Metiers* at Paris. The continuity of the main arch from the crown of the upper vault, through the flying buttresses to the ground, does not appear to have been broken; and if so, the opening or crack was of little consequence. Yet in face of all the above facts, the restoration of the vault was interdicted, and in lieu of a solid "vaulted roof embracing the highest branches of constructive science, after the manner and principles pursued by freemasons in the beautiful gothic edifices of Europe," it was resolved to descend to an imitation in wood-work with a flat roof above.

Though of minor importance and beauty, the wooden roof is well spoken of in the Report of the Committee of Survey: "The groined roof of the nave is, we believe, the first work of the kind ever attempted in this country, and involving as it does the practical application of some of the most difficult principles of constructive carpentry, the successful completion of such a work under all the difficulties attendant on the employment of native carpenters, who had to be instructed in every stage of the work, is highly creditable to the skill and science of the executive officer, Major HUTCHINSON."

Before closing these preliminary remarks, we would fain notice the painted glass windows of the west and east ends of the nave. They are decidedly lions in our town, admirable specimens of rich transparent colouring, not frittered in small fragments, but in the new style, of colours burnt in on large panes of 24 by 16 inches.

The design of St. PETER receiving the keys is from RAPHAEL's Cartoon; MOSES and AARON are on either side, and the four Evangelists

fill the compartments below. The Faith, Hope, and Charity of the west windows are taken from the designs of Sir Joshua Reynolds in New Church, Oxford.

From the great size of the panes of thin glass the difficulty of repairing any of them, if broken, will easily be understood. Yet by an accident, two panes were broken in putting up. The head and neck of Hope was smashed to atoms by the falling of a bambu! Although it is hard to excuse the occurrence of any accident where precautions should have rendered it impossible, we cannot but praise the ingenuity with which it was repaired, so that the damage is not perceptible. The fragments were united together with a transparent varnish on another pane of colourless glass. The only question is as to the durability of the cement; we should fear it would grow brown by age and exposure.

Report on the Demolition of the Vaulted Roofs of St. Peter's Church.

"A continuous and perfect equilibrium of the several parts of a building, and the concentration of all the forces, whether vertical or lateral, on a few principal supports, which for the sake of lightness, elegance and economy, are calculated to sustain no more than their allotted pressure, being *fundamental* principles in Gothic architecture; the demolition of such a structure (more especially if the equilibrium has been destroyed by the weakening of those supports) must at any time, even with the aid of powerful means, be considered an undertaking of much difficulty and danger; but in this country, with the assistance of native workmen alone, it becomes a duty demanding the utmost vigilance and attention; consequently in the removal of the vaulted roofs of St. Peter's Church, it became of primary importance to ascertain, with precision, the extent and character of the existing derangement of equilibrium, as a correct basis for calculation and design, in the operations to be pursued. With this view, a particular and most minute inspection of all the several parts of the edifice was made, of which the following was the result:

Foundations.—With regard to the foundations, it was ascertained, that the sinking, which had taken place from the nature of the alluvial soil, was exceedingly small*; any tendency there might have been to sinking in the main pillars having been counteracted by the heavy reversed arches extending under the basement from pillar to pillar.

* The sinking of the pillars most injured by the punkah beams not exceeding $\frac{3}{8}$th of an inch, which was as little as could be expected from a general settlement in a brick building, and by no means capable of affecting the equilibrium.

Vaulted roofs of side arches and pillars.—The vaulted roofs of the side aisles were found in a most dilapidated state, as likewise the main pillars at the points d'appui of the springing of the ribs, upon which rested the load of the side vaults. Upon the removal of the punkah beams (*r**) shewn in the accompanying section, (which had never been removed by any Committee) it was at once evident that the principles upon which the equilibrium and consequent stability of the side vaults and pillars depended, (and according to which they had originally been constructed,) were entirely destroyed; viz. 1st, the thickness of butment inwards, originally given to the main pillars, had been reduced in the direct line of thrust from 4 to 2 feet, by the perforation of large holes, for the insertion of beams upon which to suspend punkahs; 2nd, the adhesive continuity of the cemented materials (upon which the stability of pillars composed of brick and mortar so entirely depend) had been completely disturbed in the vicinity of the holes, from the blows of the iron instruments by which they had been made; 3rd, the springing of the main ribs, upon which the side vaults rested, had been wholly cut away on either side as exhibited at (*ss*), by which the vaults, *deprived of their supporting points,* sunk down both in haunch and vertex from their original position, thereby greatly increasing the force with which they pressed against the main pillars†; 4th, the main pillars being so greatly weakened by the perforation of the holes, and the disturbance of the cemented material, yielded inwardly‡ to the extent of $4\frac{1}{2}$ inches from the perpendicular, and became cracked entirely across; the parts marked (*tt*) splitting off from some of them. Thus all equilibrium was inevitably destroyed.

Vault of the nave, flying buttresses, cleristory walls, &c.—The above facts being established, the examination was carefully extended to the vault of the nave, the flying buttresses, the external and cleristory walls and towers: but with the exception of some cracks in the flying

	Ton.	Cwt.
* Weighing in each aisle, ...	1	3
Ditto Nave, ...	2	6

independently of the weight of the punkahs.

† The exact estimation of their increased force is a question of much difficulty, from its being connected with circumstances not within the reach of calculation, viz. the amount of injury accruing to the arch and pillar by the penetration of the rain into the spandrils and through the arch; also the amount of pressure from the sinking of the abutment of the cleristory walls, which rested in part on the arch: but that it must have been very great will be evident to every one acquainted with the rules and principles of construction.

‡ A slight deflexion of the pillars inwardly had been observed before the punkah beams were inserted. This deflexion, Sir Christopher Wren states, is to be observed in all the Gothic Cathedrals in Europe, from which it would appear to be a circumstance incidental to this style of Architecture; but that it is not productive of any important derangement of equilibrium, is fully proved by the great durability of the Gothic structures in Europe.

buttresses, owing to the sinking of the side vaults, the whole was found in such good condition, as to remove any apprehension as to the firmness and stability of the main vault, &c. which being well supported by the flying buttresses, and those of the outer walls, no external shores were judged necessary; and as in its construction it was wholly independent of the side vaults, it was concluded, that notwithstanding the shocks it might be expected to receive from their demolition, yet that they might, when properly secured, be proceeded with in perfect safety, without any fear of danger arising thereby to the main vault. Accordingly, the only point which demanded immediate attention was the counteraction of the imminent danger to be apprehended, from the further sinking and spreading of the side vaults, by which, the main pillars in their shattered condition were liable to be forced inwardly, and thereby to entail the consequent and sudden downfal of the entire building. As this danger could only be prevented by the construction of such massive shores on the nave side, which should be able to resist every power that could possibly be exerted by the spreading of the side vaults, the following plan of shoring, preparatory to the removal of the side vaults, was adopted, and pursued with success.

Mode of shoring.—A solid bed of masonry (*a*) was laid for the firm support of the foundation beam (*b*), upon the extremities of which were fixed in mortises the uprights (*cc*); these were hollowed out to fit closely to the main pillars, their base or lower ends being enlarged and strengthened by the additional blocks (*gg*) to which they were firmly joggled, and bolted, in the manner shewn.

The straining beam (*d*) being then fixed at one end in the upright (on a line with the shattered part of the pillars and strain of the side aisles) by a semicircular tenon working in a similar mortice, the other end cut to a tenon with a slight angle, was by means of three jack screws (as shewn in the distance, forced up a smooth inclined mortise well greased, cut in the opposite upright, and thus brought into a horizontal position. The shores or struts (*ee*), let in obliquely upon the foundation beam (*b*), were then fixed in the mortises cut in the uprights, and straining beam (*d*), and firmly wedged up into their places and secured by the footsil (*f*); thus, the thrust of one aisle was brought into play against the thrust of the other, and further spreading of the side vaults effectually prevented.

Centres for supporting the roofs of the side aisles.—The above work having with great care and labour been accomplished, four strong centres or framings were next constructed, as shewn in *fig.* 2; which when put together, were, by means of wedges underneath, brought firmly up to the masonry of the vault; and thus securely supported, the

work people were enabled by means of crow-bars and pick-axes to commence the demolition of the side roofs without any apprehension of danger. These frames being made movable, the expence of centreing up the entire side vaults was avoided. The vaulted roofs of the aisles were thus safely removed, without the slightest injury arising to the centre roof of the nave, thereby confirming the correctness of the opinion formerly advanced that no danger would arise to it. Accordingly measures were now taken for the removal of the main vault, together with the flying buttresses and cleristory walls. The erection of any external shores was still considered wholly unnecessary, but from the great height of the nave (46 feet), it became indispensable to secure the work people from all probability of danger, during the progress of demolition, by any portion of the vault falling inwardly, when the vertex or keying should be cut away; but as the construction of a frame-work of sufficient strength underneath the vault could not have been executed without incurring considerable expence, the following plan was devised and put into execution.

Mode of removing the great vault of the nave.—The upper pinnacles and battlements of the north and south cleristory walls were removed, and a planking laid upon the top of the walls, which admitted of a platform (*k*), fig. 3, placed across the roof being easily slid along its whole length. This platform, in order to give perfect security to the work people, in the event of any part underneath giving way, was suspended by ropes from the four towers, as shewn in the section; and upon this the work people were enabled to commence the demolition of the roof with perfect confidence; but so firm was the masonry found to be, that they soon got off on to the roof itself, although entirely unsupported from below, and the continuity of the arch was destroyed by cutting from the vertex downwards, thus giving the most unequivocal proof of its exceeding firmness and stability. In this manner the entire roof was destroyed; after which the flying buttresses being cut at their two extremities, were allowed to fall inwardly; and finally the cleristory walls were brought down to a level with the shattered parts of the columns. Having thus briefly shewn the state in which the foundations, roofs, and pillars were found, after a most careful examination, and the plan pursued in the removal of the roofs, abundant evidence has been furnished of the ultimate cause which destroyed the safety of the building, and it can only be a matter of surprise, that an edifice, constructed of brick upon the principles of Gothic architecture, should (after the main supports of the side aisles had been cut away, and the pillars reduced to *half* their original strength), have so long resisted the fatal injury committed; the punkah beams having been put up in 1827." G. Hutchinson, *Major, Engineers.*

III.—*Statistical, Agricultural, and Revenue Return of Muthra District, made up to 1st October, 1835. By Capt.* R. Wroughton, *Rev. Surveyor.*

STATISTICAL.

Number of Tuhseeldarees.	Designation of Tuhseeldaree, or Native Collectorship.	Pergunnahs and Talookas appertaining to each Tuhseeldaree.	Houses.		Total Houses.	Population.					Chopals.	Ustuls.	Mundals.	Durgahs.	Carts.	Milk and grazing Cattle.	Beasts of burden, including Elephants, Camels, Horses, Mules, Asses, and Bullocks.
						Hindoos.		Muhammedans.									
			Pukka.	Kucha.		Males.	Females.	Males.	Females.	Total Population.							
1	Julleysur,.....	Awa Missir Tal,	217	14522	14739	52359	37001	4567	3325	97252	247	24	21	14	155	23807	1646
2	Maat,.....	Soneyee,.....	1	1644	1645	5723	3838	242	158	9961	62	7	0	0	4	2321	71
		Rayuh, ...	2	1366	1368	5104	3642	75	62	8883	56	7	0	1	0	2481	89
		Maat,.....	11	7499	7510	21636	16542	1120	930	40228	74	60	2	4	79	15996	282
3	Nooh Jheel, ...	Nooh Jheel, ...	1	4888	4889	15768	11379	1136	763	29246	210	15	10	1	35	11024	745
4	Muhabun,.....	Muhabun, ...	377	11030	11407	32726	22984	2077	1539	59326	237	56	28	9	61	13085	1757
5	Kosee, ...	Kosee, ...	353	7510	7863	17977	13280	2507	1876	35640	215	103	89	45	213	9355	470
6	Suhar, ...	Suhar, ...	25	7247	7272	17076	11734	1586	939	31335	194	110	130	45	567	10795	1954
		Sheergudh, ...	25	3263	3288	7634	5576	1516	1114	15840	62	39	19	16	39	2433	98
7	Areeng,.....	Areeng,.....	21	2959	2980	7966	5112	308	198	13584	85	46	17	7	309	4336	281
		Sonk Tal, ...	0	192	192	3601	2928	99	74	6702	110	25	4	2	92	2788	130
		Gowurdhun Tal,	237	1880	2117	5822	4034	681	324	10861	36	17	66	1	15	2947	131
		Sonsa Tal,.....	1	1161	1162	3289	2301	279	152	6021	32	13	6	0	49	2464	467
8	Saidabad, ...	Saidabad,.....	105	9049	9154	30648	23678	2099	1816	58241	180	15	5	7	241	7975	795
		Suhpoo,.....	0	2302	2302	8072	5815	601	431	14919	54	5	2	1	2	1631	232
9	Hussoor Tuhseel,..	Muthra,.....	8906	7320	16226	45947	37071	3952	3586	90556	130	50	251	32	278	7288	1255
9			10282	83832	94114	281348	206915	22845	17287	528395	1984	592	650	185	2139	120726	10401
	The above gives an average to each square mile on total superficial area of district, amounting to 1587 square miles, of		Houses.			Population.					1·2	0·37	0·40	0·11	1.3	76	6·55
			Pukka.	Kucha.													
			6·48	5·29		332·9											

Abstract.—The average number of houses per village is 60·91=persons to each house 5·61=Hindoos to Muhammedans, as 12 to 1=males to females, as 19 to 14. Bullocks to each plough 2·05 : Cultivation to each plough, 18 acres, 0 roods, 10 poles.

Agricultural Detail.

Number of Tuhseeldarees.	Designation of Tuhseeldaree, or Native Collectorship.	Pergunnahs and Talookas appertaining to each Tuhseeldaree.	Number of Villages.			Total Number Villages.	Land-holders.		Total Land Holders.	Cultivators.		Total Cultivators.	Ploughs.		Total Ploughs.	Draft Cattle.		Total Draft Cattle.	Wells.		Total Wells.
			Uslee.	Daklee.	Muafee.		Numberdars.	Putteedars.		Koodkasht.	Pykasht.		Koodkasht.	Pykasht.		Koodkasht.	Pykasht.		Pukka.	Kucha.	
1	Julleysur, ...	Awa Missir Tal,	286	79	7	372	342	174	516	6304	205	6509	11512	213	11725	24045	426	24471	2212	3773	5985
2	Maat, ...	Soneyee, ...	19	0	0	19	112	217	329	926	13	939	1071	13	1084	2197	26	2223	219	530	749
		Rayuh, ...	19½	1½	5	26	115	224	339	599	132	731	1019	97	1116	2055	200	2255	274	356	630
		Maat, ...	44	15	3	62	289	1243	1532	1548	225	1773	3586	140	3726	7787	283	8070	461	1187	1648
3	Nooh Jheel, ...	Nooh Jheel, ...	96	19	0	115	268	387	655	2413	371	2784	2879	386	3265	5968	765	6733	604	606	1210
4	Muhabun, ...	Muhabun, ...	88	12	15	115	423	1937	2360	2615	906	3521	4742	260	5002	9569	520	10089	829	2464	3293
5	Kosee, ...	Kosee, ...	63	36	0	99	469	3970	4439	1805	999	2804	3369	363	3732	6942	16	6958	628	357	985
6	Suhar, ...	Suhar, ...	63	18	10	91	363	3620	3983	4667	4935	9602	3819	189	4008	7658	382	8040	366	518	884
		Sheergudh, ...	28	6	6	40	119	580	699	719	451	1170	802	99	901	1607	199	1806	266	213	479
7	Areeng, ...	Areeng, ...	21	4	3	28	164	591	755	1804	716	2520	1335	289	1624	2874	561	3435	155	197	352
		Sonk-Tal, ...	15	118	3	136	229	2241	2470	1871	1065	2936	1332	0	1332	2591	0	2591	55	202	257
		Gowurdhun Tal,	12	1	3	16	93	304	397	912	440	1352	634	66	700	1312	0	1312	95	127	222
		Sonsa Tal, ...	15	4	2	21	112	575	687	857	480	1337	721	133	854	1467	266	1733	67	149	216
8	Saidabad, ...	Saidabad, ...	93	203	0	296	467	2083	2550	2324	879	3203	5037	899	5936	10268	1710	11978	471	5643	6114
		Suhpoo, ...	24	15	0	39	110	226	336	619	124	743	1416	115	1531	2799	228	3027	69	1199	1268
9	Hussoor Tuhseel, ..	Muthra, ...	32	19	19	70	174	400	574	1456	658	2114	1631	150	1781	3262	300	3562	798	159	957
9			918½	550½	76	1545	3849	18772	22621	31439	12599	44038	44905	3412	48317	92101	5882	98283	7569	17680	25249

The above gives an average to each square mile on total superficial area of district, amounting to 1587 square miles, of

Villages.	Land-holders.	Cultivators, Koodkasht.	Plough, Koodkasht.	Draft Cattle, Koodkasht.	Wells.	
					Pukka.	Kucha.
0·97	14·25	19·81	28·29	58·22.	4·76	11·14

REVENUE.

Number of Tuhseeldarees.	Designation of Tuhseeldaree, or Native Collectorship.	Pergunnahs and Talookas appertaining to each Tuhseeldaree.	Productive and unproductive Return. Total Cultivation. Acres.	Total Cultivation. Beegahs of 2756¼ S. Y.	Total Malgoozaree, e. i. cultivated, culturable, and fallow. Acres.	Total Malgoozaree, e. i. cultivated, culturable, and fallow. Beegahs of 2756¼ S. Y.	Barren, waste, or otherwise unproductive. Acres.	Barren, waste, or otherwise unproductive. Beegahs of 2756¼ S. Y.	Total Area. Acres.	Total Area. Beegahs of 2756 S. Y.	Amount annual Revenue Furrakabad Rupees.	Average per Acre of 4840 square yards on present Jumna. On total Area. Rs. As. P.	On total Malguzarree. Rs. As. P.	On Cultivation. Rs. As. P.
1	Julleysur,.....	Awa Missir Tal,	143688½	252183	155657½	273133	32533½	57026	188191	330159	318362	1 11 0	2 1 11	2 3 5
2	Maat,.....	Soneyee, ...	17825	31300	19349	33974	888	1561	20237	35535	52198	2 9 3	2 11 1	2 14 10
		Rayuh, ...	14585	25609	15613	27412	385	675	15998	28087	28475	1 12 5	1 13 2	1 14 9
		Maat,.....	54872	96359	56281	98833	12106	21265	68387	120098	111095	1 9 11	1 15 6	2 0 4
3	Nooh Jheel,.....	Nooh Jheel, ...	60411	106080	62319	109434	14335	25190	76654	134624	130391	1 11 2	2 1 5	2 2 6
4	Muhabun,.....	Muhabun,.....	76098	133635	82763	145296	10570	18513	93333	163809	167896	1 12 9	2 0 5	2 3 3
5	Kosee, ...	Kosee, ...	82402	144697	89375	156909	8064	14143	97439	171052	153412	1 9 2	1 11 5	1 13 9
6	Suhar,.....	Suhar, ...	93061	163319	103473	181668	11779	20659	115252	202327	109048	0 15 1	1 0 9	1 2 8
		Sheergudh, ...	29433	51687	38972	68417	4586	8045	43558	76462	32265	0 11 10	0 13 2	1 1 6
7	Areeng, ...	Areeng, ...	38627	67830	44522	78168	4622	8108	49144	86276	38058	0 12 4	0 13 8	0 15 9
		Sonk Tal, ...	33323	58514	36997	64960	2793	4898	39790	69858	51400	1 4 8	1 6 2	1 8 8
		Gowurdhun Tal,	15812	27769	17760	31181	2010	3523	19770	34704	19683	0 15 11	1 1 8	1 3 11
		Sonsa Tal,.....	17020	29887	18843	33078	1262	2213	20105	35291	27379	1 5 9	1 7 2	1 9 8
8	Saidabad, ...	Saidabad, ...	77613	136238	83084	145821	10934	19169	94018	164990	230303	2 7 11	2 12 4	2 15 5
		Suhpoo,.....	18657	32737	19709	34570	1301	2268	21010	36838	57214	2 11 6	2 14 10	3 1 0
9	Hussoor Tuhseel,..	Muthra, ...	37754	66295	42861	75240	10406	18255	53267	93495	30101	0 9 0	0 11 2	0 12 9
9			811121	1424139	887578½	1558094	128574½	225511	1016153	1783605	1557280	1 8 7	1 11 5	1 13 9

The above gives an average to each square mile on total superficial area of district, amounting to 1587 square miles, of

Superficial area of district excluding space occupied by Jumna river, 1587 square miles.

Revenue.

Sa. Rs. As. Ps. Co. Rs. As. Ps.
981 4 4 = 1046 10 11½

IV.—*Notes on the State of the Arts of Cotton Spinning, Weaving, Printing, and Dyeing in Nepál. By Dr.* A. Campbell, *attached to the Residency.*

[Read at the Meeting of the 2nd December.]

It may safely be asserted, that the arts generally in Nepál have not hitherto arrived at any degree of advancement, beyond that attained in the plains of India. In regard of those which have attained to considerable perfection below, Nepál is extremely backward in the progress made by her people, nor do I know of any in which the Nipálese can be said to excel their Hindu brethren of India, except the useful one of agriculture, to which may be added, perhaps, brick and tile making; and, in more recent days, the manufacture of flint-lock fire arms.

In the art of weaving, it is universally admitted, that neither the Egyptians of the olden, nor the nations of Europe in the modern, time have equalled, or do excel, the Hindus of Dacca and Benares; while this art in Nipál, is still at the very lowest possible grade of advancement. It is matter of curiosity, as well as of astonishment, that although the Newárs claim, and not improbably hold, a title to considerable antiquity as a united people*, and have made great advances in husbandry, some progress in literature and architecture, they have not got up to this day, beyond the threshold of civilization in that art, which, among the rudest nations, has been found in a state of much efficiency†.

Some one of the Roman philosophers, I have read, gave credit to Semiramis, for the invention of weaving cotton; and Minerva herself, was, I believe, an enthusiast, and proficient in the labour of the loom. Our Nipálese queens of the present day are too proud of their Rajput, or "Moon-born lineage‡," to indulge in the practice of the useful arts. And the goddesses, although abundant as the grains of sand on the sea shore, are now but images of the olden personifications; consequently, the weaving art has not descended to the modern representatives of the above-named ladies; but still cleaving to the sex, as a pastime, or profession, we find it confined solely to the women, among the Newárs. The men toil at other labours, but they weave not, "neither do they spin." Weaving is scarcely a trade in the valley of

* See Mr. Hodson's Legends of the Origin of this Tribe in the Asiatic Journal.

† The Mexicans, at the time of the conquest of their country by the Spaniards, had manufactures of cotton cloth in considerable perfection—"of cotton they made large webs, and as delicate and fine as those of Holland."

‡ Chandra Vansa.

Nepál, for all the Newár women, of the poorer classes, (and there are scarcely any others now,) weave the cotton cloths required for the consumption of themselves and families.

These fabrics of domestic manufacture are all of cotton, and of the coarsest and most inelegant description. The cotton is grown in abundance throughout the hottest valleys of the Nipálese hills, and in the Taraï skirting their plainward face. It is brought on men's shoulders*, as picked, with the seeds in it, to the different towns of the valley, where it is exchanged to shop-keepers, for money, or other produce, as the case may be; and thus each family, as its means will admit of, purchases, from time to time, so many pounds of the raw material as suffices for the employment at the cleaning machine and spinning wheel of the mother and her daughters.

The cotton is separated from the seeds by the women, either with the fingers, or by the help of a most primitive contrivance, of the following description, and called *Keko*. Two rollers of wood, the thickness of a walking stick, and close together, are placed in an upright frame, and made to revolve on one another by means of a handle attached (through one side of the frame) to the lower of them. The operator, sitting on the ground, places the frame between her feet, steadying it with her toes, and applies small portions of cotton to the spaces between the rollers with her left hand, while she plies the revolving handle with the right: in this manner the cotton is drawn between the rollers; the seeds, being too large for the interspace, are separated and left behind.

The spinning is equally primitive, but its mode not easily described. The machine† is small, and easily portable, even by a child of six years old; it is not raised from the ground by means of legs, as is the domestic one of the Scottish Highlanders, and Northern Irish, (the ones I am best acquainted with;) nor is the wheel set in motion by the pressure of the foot on a board connected by a thong of leather, with a lever or cramp fixed to its axle, as is common in turning grind-stones, or turning lathe-wheels; but, the spinner, as in the cotton-cleaning process, sits on the ground, with one hand turning

* Man is the only animal of burden employed in the valley of Nepál, as well as the interior of her hills—a circumstance of itself strongly pointing out, how short a way the inhabitants have advanced beyond sheer barbarism. The uneven surface of their country is scarcely sufficient to save them from this imputation. The rulers of the land drive English carriages, while the transport of every article in their dominions is made on men and women's backs—a good specimen of eastern pomp, associated with its common accompaniment, hard-worked poverty.

† Called *Yeáú* by the Newárs.

the wheel by means of a handle, and with the other, drawing out the cotton into thread.

An iron rod is attached by means of a string to the wheel, and revolves in company with it, on which the thread, as spun, is collected, and in this manner, women and girls of all ages employ themselves, when not assisting at sowing or reaping, either in front of their dwellings, in the towns, or at the road-side, as may best suit their convenience*. The spinning wheel may be best described by saying, that it is but the ancient distaff, improved by the addition of a wheel for keeping it in motion; for the sharp-pointed iron rod, to the extremity of which the cotton is applied, and by which it is spun into thread, is precisely the spike of the distaff, and like its prototype, serves the double purpose of a bobbin on which the thread is accumulated as spun. The spinner turns the wheel from left to right while forming the thread, and to allow the portion spun to be accumulated on the iron rod, gives the wheel a small turn in the opposite direction, at the same time, lowering her left hand, so as to permit the winding-up of the thread. This necessary interruption in the spinning process, is a great drawback on the time of the spinner, and renders the distaff wheel very inferior, when compared to the common one of Europe. When tending cattle, or watching their ripe crops, the females generally wile away the time, and assist in replenishing the family wardrobe by spinning or weaving in the open air.

Having thus imperfectly spun the yarn, we proceed naturally to the warping and weaving of it, both of which processes are performed exclusively by women, with the very simplest and rudest machinery, equalled by the coarsest and most ungainly produce. The ordinary breadth of the Nipál cotton cloths is about half a yard, and rarely exceeds two feet. The average length of the webs is from 6 to 12 and 14 yards, and the texture of the finest is not superior to the *dosúti* cloth of Hindustán, used for house canopies *(chhats)* and floor cloths.

When a *Newár* woman has spun a sufficient quantity of thread for the warp of a web, she winds it off the iron rod, on which it has been spun, into (or, on) large bobbins of about nine inches long, and fit to hold three or four pounds of thread.

With these large bobbins, and a few reeds, about three feet long, she repairs to the nearest grassy spot without her village, or to the side of the causeway, if unpaved, and there, sticking the reeds in the ground,

* The universality of the spinning wheel may be readily credited, on the announcement of a custom which enjoins every Newár parent to present his newly married daughter with a *Yeáú* and *Keko* in addition to her dowry.

(a few feet asunder,) to the length of her purposed web, she has prepared the only warping frame known throughout these regions.

Tying the thread to the reed on her extreme right, she moves rapidly up and down along the line, passing the thread (as it comes off the bobbin, revolving on a shaft passed through its axle, and held in her right hand), on alternate sides of each reed, until the "warp is laid."

The dexterity acquired by the women, in warping, is considerable, and the quickness with which they entwine the thread, with the warping reeds, is remarkable; and apparently, it is executed with little trouble. I have often seen those women moving up and down, and laying the warp regularly on the frame, at a fast walk, and all the while talking and laughing with the persons present, and assisting them in the performance of their task.

Having "laid the warp," the reeds (or rods of wood, as the case may be), are pulled out of the ground, and the warp, frame and all, is rolled up and carried home. All the cloths made in the valley are of uncoloured thread, which renders the warping a much easier affair than when striped webs are to be laid down.

When leisure offers for weaving the web, the women on a sunshining day spread out the warp (the warping sticks still in it) and apply with a brush, made of a suitable kind of grass, the paste necessary for smoothing the thread preparatory to putting the web in the loom.

The mode of weaving does not essentially differ from that practised in the uncivilized portions of our own country with which I am acquainted. The weaver sitting on a bench, with the loom in front of her, plies the shuttle alternately with either hand, pulling forward the swinging apparatus for laying the woof thread, close to its predecessor, and plies the treddles with her feet*. The weaving is carried on under a shed, within a sma'l verandah, or in the house; and as the roofs are generally low, the treddles are made to play in a hollow dug in the earthen floor under the loom. The loom is made of the commonest materials, and very clumsily put together, and is altogether of a piece with the poor state of the weaving art. Lest it should be thought that it is intended to connect the wretched produce of the Nepál looms, with the rudeness of the machinery, as inevitable cause and

* This portion of the loom is extremely rude and primitive; instead of footboards moving on a fixed point, to be depressed alternately, so as to make one layer of the warp threads cross the other, and thus incorporate the woof with it, we find two small buttons suspended from the lower margin of the netting, which the weaver seizes between her great and first toe, alternately depressing each foot as the woof thread is delivered by the shuttle.

effect, I may mention that the Nepál loom, and the arrangements of the weaver, are superior in some respects to those of the unrivalled manufactures of the Dacca muslin. Mill's account of the Hindu loom corroborates this; he says, "It consists of little else than a few sticks or pieces of wood, nearly in the state in which nature produced them, connected together by the rudest contrivances. There is not so much as an expedient for rolling up the warp." The weaver is therefore obliged to work in the open air, as his house could not contain him and his web at full length; "and every return of inclement weather interrupts him." The Nepál weaver rolls up the warp on its original frame, and ties it to a peg driven in the ground close to her feet, while a cross beam in front of her receives the web as it is woven*.

The Thibet woollen cloths are of infinitely superior workmanship to the cotton ones of Nepál, and indeed, are of very fine make and material, although deficient in width. It is therefore evident that in the earliest of the arts, one which must have been practised by all human societies, so soon as leaves and skins were deemed unfitting clothing, the Nipálese have been left far behind, by the Hindus of India on one hand, and by the Tartars of Bhote on the other.

Dyeing and printing come naturally enough to notice, after spinning and weaving; and the advancement made in these arts has kept an even pace with that in the former. As dyesters the Newárs are miserable artists; they cannot at this day dye a decent blue, although furnished with indigo for the purpose.

A dirty red (from madder) and a light fading green, are the colours most commonly dyed by them; but they are not *fast* and durable, nor elegant when fresh. The only tolerably good dyeing done in Nepál, is by some Cashmíris, and people from the plains.

The coarse cloths of the country are printed, in imitation of the chintzes of India and Europe, and are much worn by all classes of females, who cannot afford to purchase better stuffs; but the imitations are very badly executed, and the colours not durable. The best Nipálese chintz is printed and dyed at Bhatgaon, in the valley; and in the hills east of the valley, at a place called Dunkutuah. In the small valley of Punouti too, about 24 miles east of Kathmandu, this trade is carried to some extent, and with nearly similar success.

* The different parts of the loom are not connected so as to form one complete machine. For instance, the swinging beam and netting are generally suspended from the roof of the house.

In the commonest European loom, the bench on which the weaver sits, the beam on which the cloth is received, as well as that on which the warp is rolled, together with the swinging beam and netting, are all joined together.

A piece of best Parbattiah chintz $5\frac{1}{2}$ yards long, sufficient to make an entire dress for a woman, costs at Kathmandu 1-8-0 Nipálese rupees*.

The subjoined list of the cotton piece goods manufactured in the valley and neighbouring hills, of which specimens are now presented, may not be useless to the public, while it will tend in some degree to give practical illustration to the above remarks. As a mode of attempting to estimate the real value of these products, and to assist in throwing light on the condition of the people who make and use them, the value of money, in regard to the staff of life, may be conveniently recorded†, especially as in Nepál, as well as India, the craftsman does not, generally speaking, earn any thing in addition to the common wages of agricultural labour, or in other words, little more than suffices to fill his belly, and that of a wife and children, with plain rice, and a few spices, and to buy the raw cotton, for the manufacture of his, and their coarse clothing. Models of the spinning wheel, and cotton cleaning machine, accompany the specimens of cloth.

List of the principal cotton piece goods Manufactured in Nepál proper, and throughout the Hills; to which is added a notice of the Bhungara, or Canvas made from the inner bark of trees, and the few coarse woollens of the neighbouring hills‡.

Names by which known in the Bazar. — *Remarks.*

1. *Changa.*—Manufactured in almost every Newár's house throughout the valley, and generally in the hills. Is coarse, hard and thin in texture. Is for the most part in webs of 10, 12, to 14 yards long, and 18 inches broad, and ranges in the Kathmandu bazar, from one rupee to 1-4-0 and 1-8-0 per piece.

* A Nipálese rupee equivalent to $12\frac{3}{4}$ annas of Company's currency.

† A full grown labouring man requires for a day's good food, $1\frac{1}{2}$ mannas of rice, and his wife, with (say as an average) three children, $1\frac{1}{2}$ mannas more, or in all three mannas.

The present price (November 1835) is 26 mannas, or nearly nine days' food per current rupee; to this, add salt, spices, and other condiments, worth one rupee more, and it will be seen that the wages of labour such as a man can live on in tolerable comfort, must be about four current rupees per month, and this without any allowance for clothing, house or luxuries.

The lowest class of laborers, and artizans, in some parts of the valley, and throughout a great portion of the hills, cannot come at rice, as their ordinary food; but must be content with the coarser grains, such as murwa, bajra, kodu and Indian corn. Two current rupees per month suffice for their subsistence, and is about the price of their labour.

‡ The specimens here described are deposited in the Society's museum.

2. *Kadi.*—Thick, coarse and strong; manufactured in considerable quantity in the valley of Noakot, as well as in the great valley and throughout the hills: is much worn by the cultivators of all tribes, Parbattiahs, and Newárs. Comes to market generally in pieces of 6½ yards long, 16 or 18 inches broad, and averages at Kathmandu 12 annas to one rupee per piece. Wears long and well; like the above, is sold unbleached.

3. *Purabi Chint.*—Is an imitation of Indian Chintz, manufactured at Dunkutuah and other places in the eastern hills, generally coloured, black and red, in a small striped pattern; coarse and heavy. Is much worn by the poorer Parbattiahs, and Newárs (women). Comes to Kathmandu in pieces of five yards long, and less than two feet broad, and may be generally bought for 14 annas or one rupee per piece.

4. *Múmi Chint.*—Also manufactured at Dunkutuah and to the eastward; is very like the above; worn by the Parbattiah and Newár women, made into chúlis (boddice) and sáris. A piece of six yards long and 18 inches broad, costs in Kathmandu about one rupee.

5. *Banárasi Chint.*—Manufactured at Bhatgaon in the valley, and named from its being an imitation of the Indian Chintzes; is of different colours and patterns, not so coarse and heavy as the other kinds, but thin and flimsy. Is used as lining for jackets, and for women's dresses. A piece six yards long and half a yard broad, costs in Kathmandu about one rupee or up to 1-8-0.

6. *Kalú Chint.*—Manufactured chiefly in the hills west of Kathmandu; is coarse, heavy, very rudely dyed and printed, but the broadest of the Nipálese fabrics. A piece eight yards long by 2½ feet wide, costs about one rupee eight annas.

7. *Durkeah Chint.*—Manufactured principally at Pokra and Bútwal; very coarse and heavy, but has a better width than the Chintzes of the valley: used for jacket linings, and women's dresses; six yards long and two feet broad; costs in Kathmandu about one rupee eight annas.

8. *Bútedár Chint.*—From its spotted pattern it takes its name; is a favorite one of the Bhatgaon Chintzes. A piece of 5½ yards long and half a yard wide, costs about one rupee eight annas.

9. *Hara Chint.*—Comes almost exclusively from the small valley of Bunapa, 20 miles east of Kathmandu; coarse and hard like the rest.

10. *Púrabi Kadi.*—Manufactured in the eastern hills, is broader, and somewhat finer than the Noakote article (No. 2.); a good deal of this article is exported from Nepál to Bhote. A piece of 14 yards long and 2½ feet wide, costs at present in Kathmandu three rupees.

11. *Kassa.*—Nipálese imitation of the Indian mulmul or common gauze, a wretched manufacture. Is made in large quantities at Bhatgaon, and generally by the Newárs throughout the valley. Is used for making turbans; a piece of eight yards long and six inches wide is sufficient for a pagrí, and costs generally four annas. Worn by the poorer Parbattiahs, and some Newárs, for the Asiatic turban is not general among this latter race, a small conical skull cap being the most common head-dress among them.

12. *Bhangára.*—A very coarse and strong sackcloth or canvas, manufactured from the inner bark of trees, by the people of the hills, and much used in

the valley of Nepál for making grain-bags and sacks, for the transport of merchandize. The poorer people of the hills, who subsist chiefly by wood-cutting and carrying, make this cloth in their houses and wear it. I cannot at present ascertain the description of trees whose bark is converted into this clothing, nor the detailed process employed in making it into thread. The hill people say that several different trees furnish the appropriate bark, and that it is necessary to beat and pound it, as for paper making*, previous to spinning it into thread. The cloth is exceedingly strong and durable, and is said to stand wet for a long time without being rotted, or injured in texture. It is brought to Kathmandu, in webs of about five yards long, and 12 inches broad, which costs on an average eight annas.

13. *Rhari.*—A coarse kind of woollen blanket manufactured by the Bhoteahs of the Nepál hills, and worn by them almost exclusively: is brought to Kathmandu in pieces of 7½ yards long, and 14 inches wide, and costs about three rupees. Its texture is very thick and heavy, but it is admirably suited for the rainy season, to the inclemency of which the burden-bearing, and wood-cutting Bhoteahs, are much exposed. The Newárs do not wear this, nor indeed (as a general practice) any woollen garments. This is also for the most part of domestic manufacture, as every Bhoteah who possesses a few sheep, has a web or two of it made up annually by his family. To add to the warmth and thickness of the Rhari, it is frequently improved by beating wool into it, which gives it the appearance of felt.

14. *Bhote.*—Has its name from that of the people making and wearing it. The hill countries north of Nyakote and the valley of Nepál, up to the snows, produce this article. It is a thick and soft woollen stuff, half blanket half felt, much warmer and lighter than the rhari, but inferior to it as a protection against rain. A piece seven or eight yards long, by 18 inches wide, costs in Kathmandu about two rupees eight annas.

P. S. On submitting the above to Mr. HODGSON's perusal, he informed me of the existence among the Newárs, of some coloured cotton manufactures, overlooked by me in this list. I have procured specimens of them and of an unnoticed plain manufacture, both of which are added, they are as follows:

15. *Putassi.*—So called by the Newárs. It is a strong coarse sort of check, generally blue and white, sometimes red and white; is entirely a domestic manufacture, and very rarely procurable for purchase in the bazar, the women not weaving more of it than suffices for their own wear. Is woven exclusively by the Newár women: a piece 5½ yards long, and 2½ feet wide, costs about 2½ current rupees. There are several varieties of this stuff, as to colour and pattern (some of them being striped instead of checked), but all are coarse and heavy.

16. *Puniká.*—An imitation of the table cloth manufacture of Dinapur, and the variety technically called "Bird's eye." Three or four sorts are manufactured by the Newárs, but all save one are coarse and heavy. It is worn by the better class of Newárs, male and female, and by the Parbattiah sol-

* See the Nepál paper-making process, as described by Mr. HODGSON in the Journal of the Asiatic Society.



Nisaëtus Nipalensis
type of the new Genus Nisaëtus.

T. Black Asiatic Lith: Press.

diery occasionally. A web of six yards long by two feet broad, costs three current rupees. The manufacture of this article is confined principally to the larger towns of the valley.

17. *Bhím Poga.*—(Newári.) An ancient manufacture and article of clothing of the Newárs, but not worn by them in the present day. Is wore only by a class of outcasts, and is with difficulty procurable; its only use at present is, to roll the corpse of religious persons in previous to being burned. The warp, is of coarse cotton thread, the woof of soft spun woollen yarn, in addition to which some fine wool is amalgamated with the web in weaving it. Its texture is very soft, and is well calculated for a warm in-door wear; it is too fleecy to be kept out wet. A piece of four feet long by two feet wide, costs two current rupees.

V.—*Summary Description of some New Species of Falconidæ.* By B. H. Hodgson, *Esq.*

Genus *Aquila.* Species new. *Aquila Pernigra. Jetty* Eagle, (mihi.)

Habitat, the central and northern regions of *Nepál.*

This species is throughout of a black colour, but less pure below than above, and the tail is transversely marked with four or five broad bands of a paler and brownish hue. The cere and toes are bright yellow. The bill blue, with a black tip; the talons black, and the iris brown. It is a bird of somewhat slender form, and very graceful and powerful flight, possessing all the influential characters of the genus, as now restricted; but distinguished from its type, or *chrysactos,* by a slenderer bill, rather longer toes, and longer and more acute talons. It is two feet five inches from tip of the bill to the end of the tail, and five feet and a half between the wings; and is chiefly remarkable for the extreme inequality of size and acuteness of the talons. The orbits are downy; the sides of the cere clad in short, soft hairs; and the feathers of the hind head and neck are prolonged into a vague crest of narrow composed plumes. The cere is rather large, but not heavy; the bill longer than the head, but slight rather in form. The wings are equal to the tail, with the fourth quill longest, and all the great ones strongly emarginated, remotely from their tips; the tips being inclined a little inwards: tail even, or subrounded.

The tarsi moderate and plumed; toes nude and reticulate, with three or four scales next the talons, which, as already noticed, are very acute, and the inner fore and hind ones of extreme length and curve. The inner fore talon is the largest, then the hind one, next the central, and the outer fore, least.

The nares are obliquely cleft in the cere, and of an irregular oval shape, with the upper margin arched and tumid.

This is a shy bird, which adheres exclusively to the wild and mountainous tracts of the hills. Its body is entirely free from offensive odour and vermin, and its prey chiefly the pheasants of the region it frequents, as well as their eggs. Its weight is about $4\frac{1}{2}$ *lbs.*

Genus *Haliæetus.* Species new. *H. Albipes,* (mihi.)

This species is two feet nine inches long, and six feet eight between the tips of the wings. In colour it nearly resembles *Macei,* having the head, neck, and body, pale ruddy brown, darker on the thighs and rump; the scapulars, wings and tail, saturate brown: a large bar of pure white through the centre of the tail: and the cheeks, chin, and throat, hoary. The bill and head are considerably narrower than in the golden eagle, but the bill is fully as long in proportion to the head, and even more so. The toes are longer and less thick than in that species, and the talons rather more curved. In other respects, these members sufficiently resemble those of the type of Aquila. But the tarsi are nearly nude: the acropodia, as well as acrotarsia, wholly scaled; and the toes are cleft. The bill is longer than the head, straight towards the base, and at it nearly twice as broad as high. The lateral compression is, in general, moderate, and the ridge acutish; the hook, large; the cutting edges, even. The cere, large, nude, clad only on the sides towards the base with soft hairs, diverging from the fore angle of the eye. Nostrils, forward, sub-basal, obliquely transverse, irregularly oval, simple, and inclined to a curve at the forward extremity. The tarsi are low, thick, and gummy; plumed over the knee, and a little below it. The toes, longish, unequal, stout, cleft to their origins; but the outer *not* versatile. To the front, both tarsi and toes are scaled, as already noted; but the junction of the toes and tarsi, as well as the sides and backs of the latter, are reticulate. The central toe is as long as the tarsi. The talons are long, arched, stout, and moderately acute: the hind one being the largest. All are flat below. The wings are very nearly equal to the tail, and have the fourth quill longest. Most of the great quills are strongly emarginated, high up, on both webs. The tail is of medial length, and square. The hook of the bill and the talons are black; the bill blue; the cere yellow: iris hazel brown, and feet pure white.

This species is generally found on the banks of the larger rivers, near to where they issue into the plains, and it preys on fish.

Genus *Nisactus,* (mihi.)

The birds of this genus are distinguished by wings and tail formed upon the accipitrine model; but their nares are transverse and speculated as in the eagles. Their festooned bills have a form which is osculant between the hawks and buzzards. They have the long slen-

der plumed tarsi of *Limnœetus*, and the long, acute, and unequal talons of the noblest hawks and falcons, to which moreover they assimilate in their manners, adhering exclusively to the wilds, and killing their own prey, which consists of pigeons, jungle fowls, and partridges.

Species *Nipalensis*, mihi. *Habitat*, the lower hills and *Saul* forest.

This species is liable to vary very considerably in colour, and is sometimes found possessed of a drooping egret-like crest of two long, narrow, composed plumes. I have several specimens, procured within the past 10 years; but, as I cannot venture to determine the diversities of appearance with reference to sex and age and season, I shall describe a bird in each of the more striking aspects it presents.

1*st*. This is the uncrested and paler aspect. The head, the neck, the whole body below, with the basal and interior parts of the plumage above, are white; the wings, back, and tail, brown.

The crown of the head, and the dorsal face of the neck, have a pale fawn-coloured smearing. The cheeks, chin, and throat are immaculate; the head, neck, and body, below marked lengthwise, with narrow lines of saturate brown. The thighs are transversely barred with pale fawn; and the plumes of the tarsi, with the lower tail coverts, are unmarked. Several of the lesser wing coverts are broadly margined with white. The wings and tail have seven cross bars of saturate brown, which are vaguely seen above—clearly on the pale inferior surface. The lining of the wings is white, with here and there a heart-shaped brown mark.

2*nd*. In this, the darker and crested form, the head and neck are brown, with broad white margins,—a change caused by the expansion of the central streaks of No. 1. The cheeks and chin have a triple longitudinal marking of brown, one line proceeding from the chin down the throat, and one from either side of the gape over the cheeks. The transverse bars of the thighs are darker, being brown rather than rufous, and they are extended over the tarsi and inferior tail coverts. Lastly, from the back part of the head proceed two long, narrow, composed plumes of brown colour, forming a very graceful pendant crest.

In both birds, the bill is blue at the base, black at the tip; the cere, greenish yellow; the iris, golden; the toes yellow, and the nails, black. The largest specimen procured by me is 29½ inches long and 60 wide: the smallest is 25 inches long and 49½ wide. The former weighed 4 *lbs*., the latter, 2 *lbs*. 12 oz. The intestines vary in length from 46 to 50 inches. There are two small cœca: the gut is much more capacious above than below. The stomach, though, of course, of the solvent type, has a thickish sub-muscular outer coat, and there are soft ridges along its inner surface.

The following characters of the bill and other members and organs apply equally to the foregone, and to that which will be presently described. The bill is shorter than the head, moderately compressed, scarcely arched from the base, and scarcely straight at it, distinctly festooned, and moderately hooked, with the tip of the lower mandible very slightly truncated.

The cere is moderately sized, and covered on the sides with down and soft hairs, which latter scarcely reach forward to the nares. The nares are almost vertical, ovate, angulated, and smallish. The orbits, clad; the cartilage of the brows, nude and prominent; the eye, rather large; the tarsi, long, slender, and plumed; the toes of medial unequal length and thickness; slenderer and longer than in *Aquila* or in *Buteo*, not so long or so fine as in the noble hawks and falcons, although, as in them, possessed of rough soles and large balls; acropodia, reticulate, with three or four scales next the talons. The outer toe is connected with the central by a membrane: the talons, long, acute, and unequal, as much so as in the noblest of the hawks; the hind talon, largest, and all flat beneath.

The wings and tail are as strong and firm as in the finest of the Falconine race. The tail consists of 12 equal and broad feathers. The wings reach only to its centre. The fifth quill is the longest: but the fourth and sixth are nearly equal to it; the first considerably, the second and third, moderately and equally, graduated up to the longest; first to sixth inclusively emarginate, high up, on the inner web, and second to seventh, on the outer.

Species *Grandis*, (mihi.)

I have been able to procure but one species of this bird, which was taken alive, and lived in confinement upwards of three years. It died in December, in full plumage. It was a male, and answered to the following description. The iris is brown; the cere and toes, yellow; the bill, blue, its tip and the talons, black. Head, neck, body, and wings, saturate brown above, beneath white, stained with rufous; the tail, above, slaty-blue. The cheeks, chin, throat, and breast exhibit on each plume a central broad stripe of dark brown, following the shaft, and margined on either side with rufous, on a white ground. The thighs are, herring-boned with brown; and the tarsi and vent, narrowly streaked lengthwise with the same colour. The under tail coverts transversely barred with mixed rufous and brown: and the ground colour of the thighs and tarsi, for the most part, rufous. The lining of the wings is an irregular mixture of the hues of the upper and lower surfaces: or saturate brown and white, stained with rufous. There are six narrow, irregular cross bars on the tail, with

one broad terminal one, of a blackish hue; but the tip itself is pale. The wings and tail, on their inner surface, are whitish, irregularly crossed with freckles of brown, disposed barwise.

The bird measured 27 inches by 60, and weighed 5 *lbs.*

VI.—*Synoptical Description of Sundry New Animals, enumerated in the Catalogue of Nipálese Mammals. By* B. H. Hodgson, *Esq.*

Sciuropterus, Cuvier.

Species, *Alboniger*. Black and white.

Flying Squirrel, mihi.

Habitat, central and Northern regions of Nipál.

Sc. above black, faintly shaded with hoary or rufous; below, white, with a slight tinge of yellow; tail, concolorous with the body above, distinctly distichous, flattened, and rather shorter than the animal. Nude skin of lips, ears, and feet fleshy white. Snout to rump, 11 inches; tail, $8\frac{1}{4}$, without the terminal hair—9, with it; weight, 9 oz.

Observations. The sexes are alike: the young are pure black above, pure white below. The species has but six teats, four ventral and two inguinal. The intestines are 85 inches long, or eight times the length of the animal. They have a wide cæcum of nine inches in length, placed at 18 inches only from the anal extremity.

Species, *Magnificus*. Splendid.

Flying Squirrel, mihi.

Habitat, as above.

Sc. Above, intense chesnut, (the fruit;) below and the shoulders, golden red; tail, paler than the body above, and tipped black: a black zone round the eyes, and another embracing the mustachios; chin, pale, with a black triangular spot. Nude parts of skin, fleshy white. Tail, cylindrico-depressed, and considerably longer than the animal.

Parachute, large, enveloping six inches of the tail. Length of the animal, 16 inches, of the tail, 22; weight $3\frac{1}{4}$ *lbs.*

Observations. Sexes, essentially similar in colour. In old animals the chesnut colour tipt hoary, and, in the young, black tipt. In all, the tail, beyond the limits of the parachute, is paler than the superior surface of the body: and the black point is always present. So are the facial marks, though they be less conspicuous in young specimens. The intestinal canal is fourteen feet two inches long, or $10\frac{1}{2}$ times as long as the body; 8.8 to the cæcum; 5.6 below it. The

cæcum is 20 inches long, very capacious, and sacculated. This species breeds in the rains, and seems to produce but one young at a time. In September, the offspring are tolerably independent of their mother, but their flying membrane is much less developed than in maturity.

Genus, Sciurus, Auctorum.

Species, *Lokriah*, mihi.

Habitat, as before.

Above, saturate brown, tipped with intense orange; below, and the thighs, deep orange. Tail, concolorous with the body above, distichous, flattened, and broad, with a double margin of black and hoary. Length from snout to rump, eight inches. Of the tail, $6\frac{1}{2}$ inches, without the terminal hair, equal to animal with it; weight 8 oz.

Species, *Lokroides*, mihi.

Very similar to the last, but has the inferior parts rufous hoary; the thighs, concolorous with the body above, and the tail narrower and void of marginal bands.

Observations. The sexes alike in both the above species. Teats, six in both*. Intestines, 66 inches, or but eight times the length of the body, and of uniform calibre throughout. At 15 inches from the anal extremity, a cæcum of four to five inches long, and double the calibre of the intestinal canal.

Genus, Felis, Auctorum.

Species, *Viverriceps*, mihi. Sharp-faced Cat, mihi.

Habitat, open lowlands of lower region.

F. V. Wild cat, with subviverrine face, small ears, and short, slender, and tapered tail, reaching one inch below the os calcis. Above, and the neck, deep cat gray, or fulvous gray brown. Below, the head, tail, belly, and insides of the limbs, hoary. From the eyes to the root of the tail, four subcontinuous black lines: two more parallel to, and without, them, from the eyes to the shoulders; two perfect bands round the jaws, from the eyes: and three round the front of the neck and breast. Ears, black outside, with a large gray central spot, and rufous hoary on the inside. Body and limbs, wholly covered with roundish full black spots, having a sublinear disposition from the head towards the tail; the feet only, from the os calcis and top of the carpi, being immaculate. The tail exhibits above and below the ground colours of the body. On the upper surface, six or seven transverse bands, the two or three next the body, composed of dots, arranged linearly, and the terminal one being large, forming a blackish tip to the tail on that surface. Length, from snout to rump, 30 inches;

* In the Regne Animal, eight teats are assigned to the squirrels.

of the tail, $10\frac{1}{2}$ inches, or $11\frac{1}{4}$ with the hair: mean height, 15: weight 17 *lbs.*

Observations. This species is affined to the Viverræ by the form of its face, and to the Lynxes, by the shortness of its tail, which extends but little below the os calcis. But it has no further resemblance to either: its ears being noticeably short and untufted; its body, full, and its limbs, strong and of medial length. The females are nearly as large as the males, to which they bear a close external likeness. In the catalogue, this animal is called a variety of the Serval; but the inspection of several specimens has satisfied me of its specific novelty. It is distinctly described in the catalogue, though summarily. The intestinal canal is more than three times the length of the body, and the cæcum is an inch long, with the diameter of the large gut, which is sensibly more capacious than the small.

Genus, Felis. Subgenus, *Lynchus.*

Species, *L. Erythrotus.* Red-eared Lynx, mihi.

Habitat, all the three regions of Nipál, and abundant in all.

Lynx. Above, pale earthen brown, with a lively tinge of rusty red: below, clear, but pale ferruginous; the body, immaculate; the cubits on both aspects, and the femora externally, crossed with blackish zigzag lines; tail slender, attenuated, and reaching one inch below the os calcis; concolorous with the body towards the base, but towards the tip, paler and canescent, encircled with four or five blackish rings, and tipt with black; lips, jaw, and a zone round the eye, posteally, pure white. Ears, externally intense, rusty red, with black tip and small pencil of the same hue; their lining, rufescent white; feet, from the os calcis and top of the wrist, downwards, pale rusty, immaculate, and blackened posteally.

Snout to rump, 22 inches; mean height, 16 inches; length of tail, 10, without the hair, 11 with it; weight, 14 *lbs.*

Remarks. The female in this species is considerably less than the male, but neither sex nor nonage affects the marking of the animals. An imperfect state of the fur does so: for when the red-eared Lynx is moulting (so to speak), the sides of the body exhibit some vague, wavy, stripes, having a subvertical direction.

The tufts of the ears are always present, and the molar teeth *have* tubercles on the inner side, notwithstanding the general assertion of authors that the Lynxes want them. His lengthened limbs, large pencilled ears, and shortish tail proclaim this animal a Lynx. His resemblance indeed to the Chaus of Ruppel is so very striking, that in the catalogue I identified him with that species. From the examination of numberless specimens, I am now satified, however, that our ani-

mal is specifically distinct from the Chaus, as well as from the Lybian Caracal, to which in some points of colouring, he bears a nearer likeness than to Chaus. This species is very ubiquitarian, being equally common in all the three regions of Nepál. In the central and northern regions, he represents the wild cat, which is not a denizen of these mountains; nor (I think) of the plains of India.

The red-eared Lynx breeds twice a year, producing three or four kittens at a birth.

The intestinal canal of the species barely exceeds twice the length of the body, and is of nearly equal calibre throughout. The cæcum is but half an inch long, with a breadth somewhat less than that of the large gut. Preys on pheasants, partridges, hares, and rats: breeds in the woods, but wanders freely through the standing crops. One of them, a female, took up its abode, and bred, under the residency mansion, in the past year.

Genus Mus, Auctorum.

Subgenus, Rattus, (Mus.)

Species, *R. Niviventer.* White-bellied Rat, mihi.

Above, saturate black brown: below, pure white; tail, considerably longer than the body, and paled on the inferior surface. Size and aspect of Mus Rattus.

Observations. For some time I took this animal to be a variety merely of the common types, but I have now ascertained that it is a distinct species*. It is invariably pure white below, and even the tail is paled on the abdominal aspect.

The tail, too, is considerably longer than in Rattus.

Species, Rattus. *Nemorivagus,* mihi. Throughout, dusky brown: the centre of the belly only being paler and hoary blue; the bristles of the back, unusually long and numerous, but not erect or spiny; tail shorter than the body, size large; snout to rump, 12 inches. Length of the tail, $9\frac{1}{2}$; ears, tail, and members strictly assimilating with the ordinary type.

Remarks. The species avoids houses, dwelling in burrows in the fields, and more especially in the small woods. In the catalogue, it is called Setifer, to which species it bears much resemblance. The females have twelve teats.

Genus, Manis auctorum.

Species, *Auritus,* mihi. Eared Manis.

Habitat, lower and central regions.

* In the central region of Nepál, there are four species of Rat, Decumanus, Rattus, Niviventer, and Nemorivagus. Each distinguished by an appropiate local name, and by some peculiarity of manners.

Manis, with rounded, naked ears, verticallv developed; thick tail, more than one third thorter than the body; and scales forming 23 longitudinal series on the body and neck only. Snout to vent, 22 inches. Vent to tip of tail, 13. Weight, 12 to 14 lbs.

Remarks. In the English Regne Animal the genus Manis is said to be devoid of external ears. Presuming the correctness of this statement, I have indicated a remarkable peculiarity of the present species by the specific name Auritus. The external ear, though small, is perfectly distinct; the helix having a breadth or free exsertion from the head, of more than half an inch, and a longitudinal course of one and an eighth inch, in a direction vertically transverse. In the catalogue, this animal is mentioned by the name of the short-tailed or common Indian species, (M. Pentadactyla of Linn.) with which I then supposed it to be identical. It differs however very materially, not only by the presence of ears, but by the much greater number of its scales. In our animal, the longitudinal series consists of 23 for the neck and body alone; there being also 10 for the head, and 19 for the tail. The Manis Javanica of Desmarest is said to have a series of 17 for the body only. I presume our's yet exceeds this number. The general appearance of our animal is sufficiently assimilated to Crassicaudata; the body being rather full, though elongated, and the tail shorter than the body, and very thick at the base.

This latter member is flattened below; broadly convexed above; and its scales are shorter and wider than those of the body. The feet are pentadactylous; the colour of the scales, earthy brown, and of the nude skin, fleshly white. As I have been so fortunate as recently to witness the gestation and parturition of this species, and have been also enabled to note the animal's manners, with its anatomical structure, I purpose, ere long to give the results of these observations; and shall only add, on the present occasion, that if the incaution of authors only has led to the assertion, that the genus is earless, and the epithet *Auritus* affixed to our species thus cease to be characteristic, I would then suggest the trivial name *Plurisquamis*, or the many-scaled.

Genus Viverra.

Subgenus, Mangusta, (Herpestes.)

Species *Auropunctata*, mihi.

Habitat, the Central Region.

Mungoose. Of an uniform saturate olive brown, freckled with golden yellow, an aspect resulting from the five-fold annulation of each hair, with black and aureous; cheeks, more or less rusty; fur of the body, short, soft, and adpressed; $\frac{1}{2}$ an inch below os calcis furred; size small;

tail, shorter than the body, snout to rump, 11 inches; tail, 9 or $10\frac{3}{4}$ with the hair.

Remarks. In this species, as in the following, the tail is pointed, much attenuated from a thick base, and clad in long lax hair. The naked skin of the lips and soles is fleshy brown: the iris, brownish yellow; pupil, variable, but usually oblong and subtransverse; digits, membraned crescentwise to the third phalanges. No anal pouch, but the folds of the skin on the caudal margin of the anus are subdilated and furnished with some scattered glandulous points below the surface, probably subservient merely to the lubrication of the parts. The animal emitting no peculiar odour.

The intestinal canal is 36 inches long, or more than three times the length of the body, and of equal diameter throughout. The cæcum is one inch long, and wide as the gut. The stomach has thickish coats, and is equally broad almost at either end. The molar teeth are bristled with points almost as in the Insectivora. In the catalogue, this animal is identified with the M. Javanica of HORSFIELD. But in the judgment of very competent persons, it is a distinct species. It differs materially from the common Mungoose of the plains, not only by its smaller size, softer shorter hair, and darker colour, but by a less vermiform habit of the body and shorter toes, the soles of which, in the hinder extremities, are less extended towards the os calcis.

Species *Nyula*, mihi.

The Nyúl of the plains. Habitat, the open Taraï.

Mungoose. Varied, with mixed rich red brown and hoary yellow, the ears, face, and limbs, redder and less maculate; the neck and body below, pure pale yellow; hair of the body and tail, long and harsh, with 10 to 12 rings of alternate brown and yellow; toes, long, and in the hind extremities, nude to the os calcis; tail, concolorous with the body above, pointed and equal to the body in length. Snout to rump, 15 inches; tail, the same, or 18 with the terminal hair.

Remarks. This is the common Mungoose of the Nipalese lowlands, and of North Behar, and which is identified with Cafra vel Grisea in the catalogue, perhaps justly so: I leave it to others to judge. Both of the above species affect the cultivated fields when the crops are standing, and the grass after the crops are down. They live in burrows of their own making; and the structure of their extremities is fossorial, but not typically so; the nails being suited also to climbing trees, at which the animals are sufficiently expert.

The males are larger than the females; and the young darker hued than their parents. The females breed in spring: have four ventral teats, and usually produce three or four young at a birth. The food

of both species consists of snakes, rats, mice, eggs, small birds, and grilli.

Mr. Gray in some recent valuable remarks on the Viverridæ, observes, that the Mungooses have "long, slender, and free toes, and anal pouches of greater or less depth." I have again and again examined fresh specimens of Nyúla and of Auropunctata, with a view to these assertions, but the result of my observations is that they are almost wholly erroneous. Neither in the highland nor lowland animal is there any semblance of an anal pouch; and the toes of both are connected by a membrane as far forwards as the hinder edge of the third phalanx. In Nyúla, indeed the toes are elongated, and the hind feet nearly nude to the heel. In Auropunctata, however, the toes have but a medial length, and the fur reaches fully half an inch below the point of the heel.

The fact is, that the structure of the Mungoose, though digitigrade upon the whole, is by no means typically so: and, in the slow stealthy motion to which they are much accustomed whilst questing for their prey, they use the plantigrade action. Their nails are fossorial in the main; and, like most diggers, these animals incline somewhat to the plantigrade structure and movement. In fact, they lead off from the typical digitigrades towards the plantigrades, through the Paradoxuri, the Gluttons and the Rattels; still, however, retaining the shortish toes and lengthened compact metatarsi of the digitigrades.

Tribe, Plantigrades.

Genus, Gulo. English Regne Animal.

Species new. *Gulo Nipalensis*, mihi.

Habitat, Central region of Nipal.

G. Above, earthy brown: below, with the edge of the upper lip, the insides of the limbs, and terminal half of tail, yellow; a white mesial stroke from the nape to the hips, and a white band across the forehead, spreading on the cheeks and confluent with the pale colour of the animal's lower surface: head and body vermiformed; digits and nails of the anterior extremities stronger; half way from the os calcis to the fingers, hairy; fur of two sorts, and abundant, but not lengthened or harsh, nor annulated: tail, cylindrico-tapered, pointed, half the length of the animal; snout to rump, 16 inches; tail, $7\frac{1}{2}$, or 9 with the terminal hair.

Remarks. In the catalogue, this animal is identified with the Gulo Orientalis of Java (apud Horsfield), which is at all events, the insular analogue of our's. The cheek teeth are $\frac{5}{6}\frac{5}{6}$ and the animal consequently belongs to genus Gulo, as defined in the English Regne Animal.

The form of this species is decidedly Musteline from the snout to the tail; and not merely the head, with its several external organs, but the skull also bears a close resemblance to those of Martes and Putorius. The anterior limbs, however, are decidedly fossorial, and the hinder suited for walking in a subplantigrade manner: *both* wholly unfitted for raptatory or scansorial purposes.

Genus Gulo. Species new.

G. Urva, mihi. Habitat, Central and Northern Regions.

Urvá of the Nipálese.

G. Urvá. Above and the sides jackal colour, or fulvous iron gray; abdominal aspect of the neck, chest, and belly, with the entire limbs, dusky brown, a lateral band on either side the neck, from the gape to the shoulders, white; size and aspect of the preceding; fur of two sorts, and very abundant; hair very long, and laxly set on; quadrannulated with black and fulvous; anterior and posterior extremities of equal strength, and the nails simply ambulatory, being suited neither to raption, scansion, nor digging; for the rest, the general form of the feet as in the preceding,

P. S. The whole of the above animals were discovered by me several years back (1823-1829), and might have been described much sooner, had I not deemed it improper to hazard the multiplication of imaginary species by characterising from one or two specimens. There is not one of these species of which I have not procured several specimens at all seasons, and either alive or just killed. The indications of the catalogue are such as to entitle me to date from its publication (originally in 1829). But, in truth, my object has been, and is, much less to share in the scramble of nomenclators, than to ascertain the habits and structure of species.

Nothing is so vague at present as the true limits of species, and as my *first* aim was rather to find resemblances than differences, so perhaps it might wisely have been my *last*.

If, however, any person who chances to lay hold upon a single shrivelled skin, may forthwith announce a new animal, the real student of nature must be content to leave what is called discovery to the mere nomenclator; and the science must continue to groan under an increasing weight of ficfitious species.

B. H. H.

VII.—*Note on the occasional existence of fresh water on the surface of the ocean. By Mr.* C. Brownlow.

It is stated in a recent paper by Arago, on the subject of Artesian Wells, upon the authority of one of our most accurate observers—Buchanan—that, when on his way to India, he found fresh water more than one hundred miles from land, to the eastward of the Bay of Bengal. Arago has adduced this fact to prove, that springs rise to the surface of the globe from unknown depths. He is doubtless correct in this assertion, as long as he confines his observations to land phenomena—many causes, however, led me to doubt that *fresh* water could *rise* to the surface at sea, among which may be enumerated the effects of tides, the disturbance and friction of one fluid passing up through the other, and the strong affinity which aids their combination while thus in motion.

The fact that fresh water deposited in the shape of rain, remains unmixed with the salt water beneath, for many hours, during calm weather; that it is found at sea, around the mouths of large rivers, during serene days, at an almost incredible distance, led me to seek for an explanation of Buchanan's fact, in some less embarrassing theory than the one which Arago has adopted. I accordingly applied to Mr. Sinclair, one of the most experienced and intelligent of the members of the Pilot service, who acquainted me with the following fact.

In the month of October, 1803, in connection with Branch Pilot Bason, he took charge of the *Gungava*, an Arab ship, from Muscat, laden with horses. The passage of the vessel had been long and tedious, and they were deliberating on throwing their horses overboard, when one of the men, who had been bathing on a hatch, came and reported that the water along side was *fresh;* a bucket was thrown over, which went something below the surface, and the water brought up was salt!—on further examination, it was found that the water *on the surface* was perfectly fresh. The vessel was supplied from this source, and the cargo saved. Another member of the same body informs me, that during the Burmese war, he obtained fresh water thus when taking troops to Rangoon*.

It appears more reasonable to account for this fact, by referring to the increased impulse of the waters discharged from the Ganges during the rains, to the quantity of fresh water actually deposited on the surface of the sea, at this season of the year, and to the laws of the specific gravity which determine the relative positions of fluid bodies, than to adopt a theory which at once sets these aside, and does violence to an established principle in physics: for these reasons I think Arago's inference open to objection.

* These instances occurred over that remarkable part of the bay, the "*swatch of no ground*," the depth of which renders Arago's theory still more untenable!

VIII.—*Note on the Cervus Duvaucelii of Cuvier, or C. Elaphoides and Bahraiya of Hodgson.*

In the number of the Journal for last November, p. 648, Pl. VIII. Mr. HODGSON has given the specific characters, and a figure of the head and horns, of a deer which he describes as a new species under the name of *Cervus Elaphoides*. The author of this notice came to know this species in February 1834, from a fine specimen shot by Mr. MONEY in a jhíl near Muzaffernagar, in the Kadir of the Ganges. Finding no mention* made of it in HAMILTON SMITH's very complete Synopsis of the tribe in GRIFFITH's Translation of the Animal Kingdom, he was, like Mr. HODGSON, led to consider it as an undescribed species, to which he attached, in his collection, the specific name of *C. Enclodocerus*, and "*Bara Sinha*," of the natives. But he subsequently found that it was known to CUVIER as a distinct species. In the fourth volume of the *Ossemens Fossiles*, third edition, p. 505, the horns of the animal are described under the name of *C. Duvaucelii*, in honour of his step-son, who sent them to CUVIER from India; and in Plate XXXIX of the same volume, he gives outlines of three varieties of horns (figs. 6, 7, and 8,) which put it beyond all doubt that the *C. Duvaucelii* of the *Oss. Fossi.*, and the *Cervus Elaphoides* of HODGSON, are the same species. CUVIER's words are these:

"Cet infatigable naturaliste M. DUVAUCEL, me met encore à même de faire connoitre à mes lecteurs deux espèces de cerf des Indes entièrement nouvelles pour les naturalistes.

"La première, &c. (he then goes on to describe the *C. Wallichii.*) Nous n'avons que les bois de l'autre espèce, mais ils suffisent parfaitement pour la caractériser.

"A la première vue on les prendroit pour ceux d'un vieux cerf commun, et bien des voyageurs ont dû s'y tromper, mais c'est toute une autre courbure, et une autre distribution d'andouillers.

"Le Merrain se dirige d'abord un peu un arrière et de côté, et de sa partie supèrieure se recourbe en avant, en sorte que sa concavité est en avant comme au cerf de Virginie; mais cette courbure n'y est pas si forte.

"Il ne donne qu'un seul andouiller de sa base, dirigé en avant.

"Les autres naissent de sa partie supérieure et postérieure, et se dirigent en haut, et un peu en arrière et en dedans.

"Ils sont an nombre de deux, ou de trois, et l'inférieur qui est ordinairement le plus grand, se bifurque ou se trifurque suivant l'age; en sorte qu'au total on peut compter dans les bois que nous avons sous les yeux, et que nous représentont pl. xxxix. figs. 6, 7, et 8, de cinq à sept cors à chaque perche; quelquefois il y'a un petit tubercule dans l'aisselle de l'andouille de la base."

* Except in the note p. 116, vol. IV. where HAMILTON SMITH quotes CUVIER's name, with a conjecture that it applied to some species of the group Rusa.

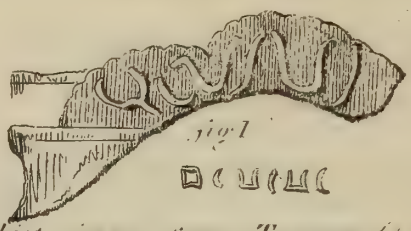
Inscription at Bamián. (See p. 188)

fig 4



Copper figure dug up near Bushire

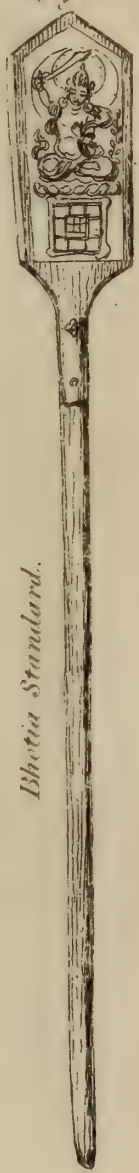
fig 1



Buddhist image from Tagoung (p. 157)
½ Size fig 2.

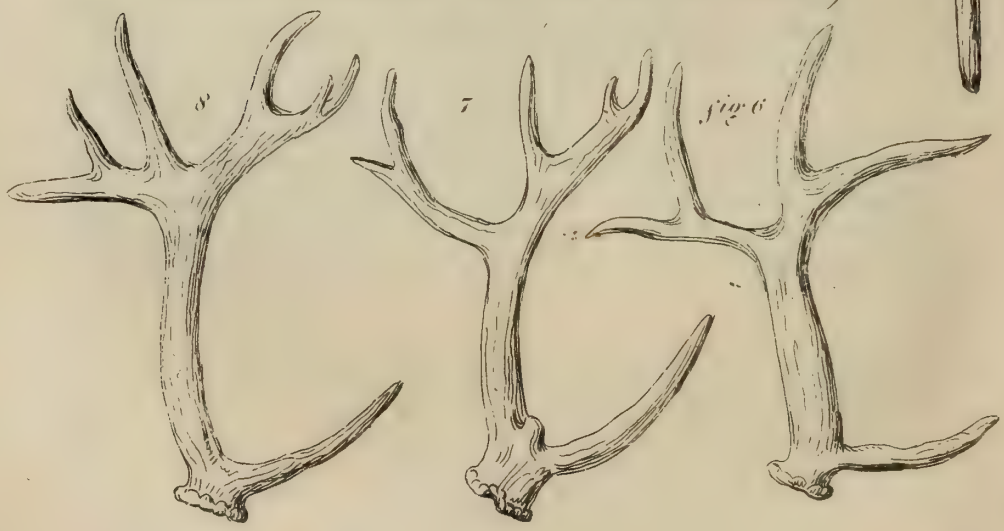


fig 3



Bhotia Standard.

Cervus Duvaucelii Cuv. (Oss. foss. V. PXXXIX)



J.Prinsep sc.

"Il est fort a desirer que l'on obtienne promptement une description du pelage de ce beau cerf; mais en attendant nous croyons devoir lui donner le nom du naturaliste qui l'a fait connoitre, et nous l'appelerons *Cervus Duvaucelii.*"

Copies of Cuvier's figures are annexed, (see Pl. VI. figs. 6, 7, 8) which differ only from Mr. Hodgson's to the extent within which varieties dependent on age and individuals range.

The designation of *Cervus Elaphoides,* must therefore give place to that of *C. Duvaucelii.*

The chief anatomical peculiarities of the head, as compared with the Jarao of the Himaláyahs, taken as the type of the Rusas, are these. The head is narrower for its length, and more elegant in its proportions, than in the Jarao. The pediciles of the horns are shorter, and more approximated on the brow. The muzzle is longer and more slender. The intermaxillaries are broad, as in the Rusas, and their ascending apophysis joins on to the nasals by a wide base. The nasals are slender, and run up into the frontal in a line with the anterior margin of the orbits: in the Jarao, the point of union is considerably lower, their lower extremity projects a little way beyond the intermaxillaries, and a re-entering angle is left between them at their tips. The nasolachrymary figure is a wide trapezium, whereas in the Himálayah Jarao, it is a long triangular slit. The depression for the suborbitary sinus occupies less space than in the Jarao, but it is deep and well defined. The lachrymal bone, at the upper angle of the depression in the *C. Duvaucelii,* is perforated by a very large oval hole; whereas in the Jarao it is imperforate. The chaffron has a slight rise on the nasals, sinks considerably in a transverse hollow between the orbits, and then starts with great prominence in the ridge which runs along the suture of the frontals, so that the plane of this ridge cuts that of the parietals nearly at a right angle. In the Jarao, the sink between the orbits is shallower, the ridge less salient on the frontals, and the angle more obtuse.

With regard to the indigenous names of the *C. Duvaucelii,* Mr. Hodgson gives the Nipálese name of *Bahraiya,* and says it is known in the western tarái as the *Mahá.* To *C. Elaphus* of the Nipálese sál forest, he gives the name of *Bára sinha.*

There is great confusion in the Indian designations of the deer tribe. Bára Sinha is a notable example. Hamilton Smith applies it (his *Barensing'ha*) to the *C. Hippelaphus,* one of the Rusas; Mr. Hodgson to one of the *Elaphine* group; and in the Tarais to the west of the Ganges, so far as our experience goes, it is given to the *Cervus Duvaucelii* or *Elaphoides,* of Hodgson. That it is inapplicable to the *C. Elaphus,* it is perhaps sufficient to mention, that the name of *Bára Sinha* is very common in the Tarái westward of the Ganges, whereas the *Cervus Elaphus* is quite unknown in this tract, so far as we happen to know. Sportsmen westward from the Ganges, call the *C. Duvaucelii,* the *Bara Sinha,* from the snags and antlers being frequently twelve in number, in the adult animal, and this seems a very good reason for the name, *Mahá,* which Mr. Hodgson

applies to the species, we have always understood to belong to the Rusa of the Himálayah; this name being given in Sub-Himaláyah tracts; and Jarao (or Jerow) in the interior of the Hills, to one or more species, but these strictly confined to the Rusa group. Mr. HODGSON's authority, as the first among Indian Zoologists, will give great weight to such names as he attaches to the deer tribe; and it is most desirable, that those most generally in use should be selected. If those who have the opportunity, in different districts, were to communicate the names by which they know the different species of the deer tribe, much of the vagueness which at present attaches to the native designations might be got over.

The following names are in common use in the plains and hills westward of the Ganges, their synonyms are also given.

Merg, applied, as a general designation for all the deer tribe; *Cervidæ* and *Capridæ*.

Jhank, applied to all the Cervidæ, but more especially to the large species.

C. Duvaucelii, CUV., and *Elaphoides* of HODG., called *Bara Singha*, *Bahraiya* of the Nipálese, HODG.

C. Hippelaphus? and *Aristolelis*, or Rusas, called *Mahá* in the Sub-Himálayan tracts, and *Jarao (Jerow)* in the interior of the mountains. Syns. *Saumer* of Bengal and *Jarai* of Nepál.

C. Ratwa, HODG., called "*Kakar*"—*Ratwa* of Nepál.

A. Ghoral, HARDW., *Ghoral* everywhere.

A. Thar, HODG., called "*Sarao*" (*Surrowa*) in the hills between the Ganges and Tonse; between the Tonse and Sutlej called "*Eimoo*," the *Thár* of Nepál.

A. Tetracornis, called "*Chouka*" or "*Chousinga*." *Chikara* on the authority of HARDW.; but this name applied to the

A. Acuticornis? or *Subulata?* an elegant small sized antelope, with horn on the females, numerous about Delhi, and there called "*Chikara*."

Capra Jharal, HODG. (*Quadrimammis?* see p. 254) called *Tehr* and *Thár; Jharál* of Nepál.

C. Ibex? called *Sakeen* in Kanáwar. This species, which is strictly an *Ibex*, is got along with the *Bhuroor*. It does not appear to be known to Mr. HODGSON; Major KENNEDY had two stuffed specimens at *Subatu*.

Ovis Nahoor, HODG., called *Bhuroor* near the source of the Ganges; *Nahoor* of Nepál.

The *Antilope Cervicapra*, (*Hiran;*) *Cervus axis*, (*Cheetul;*) *C. Porcinus*, (*Parah;*) *Antilope Picta* or *Damalis Resia*, (*Nilgao,*) are so generally known by these names, that it is hardly necessary to mention them.

Note.—The animal to which the above principally refers was known to Mr. HODGSON from 1820, when there was a live one in the Durbar Menagerie at *Katmandhu*, though not accurately observed by him, he had, and used, the occasion of another specimen being there in 1825, to note the characters of the beast. Monsieur DUVAUCEL was his friend and correspondent, and was assisted by him to the utmost; two of his collectors lived in his house at Katmandhu for a year (1827-8,) and were furnished out of his own stores with sundry specimens.

M. DUVAUCEL may therefore have procured the beast from him, or through him; it is certain that Mr. H. knew this stag before the latter came to India.—ED.

IX.—*Horary Observations of the Barometer, Thermometer, and wet-bulb Thermometer, made at Calcutta on the* 21*st and* 22*nd of March,* 1836. *By Mr.* H. Barrow, *H. C. Mathematical Instrument-maker.*

1836. Date.	Hour.	Barometer.	Attached Thermometer.	Wet Bulb Thermometer.	External Thermometer.	Barometer Reduced to 32°.	Depression of Wet Bulb Thermometer.	Remarks.
21 March	6 A.M.	29,975	74,0	68,8	69,5	29,879	5,2	
	7	,998	74,0	68,0	70,0	,902	6,0	
	8	30,016	75,0	68,0	74,0	,917	7,0	
	9	,019	76,0	68,0	76,2	,917	8,0	
	10	,031	77,0	69,2	79,5	,926	7,8	
	11	,040	78,5	69,0	81,0	,931	9,5	
	Noon.	,026	80,0	69,2	81,8	,912	10,8	
	1	29,998	81,0	70,0	83,0	,881	11,0	
	2	,975	81,5	71,0	84,5	,856	10,5	
	3	,951	81,8	70,6	83,5	,831	11,2	
	4	,926	81,5	70,0	81,0	,807	11,5	
	5	,926	80,5	69,3	80,0	,811	11,2	Rain with thunder and lightning, which continued part of the next day.
	6	,953	79,9	69,2	77,0	,839	10,7	
	7	,938	77,1	69,7	71,0	,833	7,4	
	8	,957	76,0	69,0	72,0	,855	7,0	
	9	30,001	76,0	69,9	72,0	,899	6,1	
	10	29,970	76,0	68,0	71,6	,868	8,0	
	11	,951	74,9	67,5	71,0	,852	7,4	
22 Do...	Midnt.	,964	74,8	70,0	71,3	,865	4,8	
	1	,944	75,1	70,1	70,0	,845	5,0	
	2	,942	75,0	70,5	68,0	,843	4,5	
	3	,938	75,0	70,5	68,0	,839	4,5	
	4	,932	74,5	70,0	68,0	,834	4,5	
	5	,961	75,0	70,6	67,0	,862	4,4	
	6	,982	72,7	68,0	67,5	,889	4,7	
	7	30,000	71,4	68,0	70,5	,912	3,4	
	8	,015	73,0	70,0	74,0	,912	3,0	
	9	,030	74,6	69,5	74,0	,932	5,1	
	10	,040	74,5	69,3	74,5	,942	5,2	
	11	,028	74,0	68,3	75,0	,932	5,7	
	Noon.	,000	74,5	69,0	78,0	,902	5,5	
	1	29,973	75,0	69,5	77,5	,874	5,5	
	2	,947	75,5	69,0	83,0	,847	6,5	
	3	,916	76,5	70,0	79,5	,813	6,5	
	4	,904	77,2	69,5	80,0	,799	7,7	
	5	,911	78,0	69,5	80,0	,803	8,5	
	6	,916	77,5	70,0	77,2	,810	7,5	

The above observations were made with a Barometer in every respect the same as the one used on the 21st and 22nd of December last, except that the bulb of the attached Thermometer is inserted in the Barometer cistern to better ascertain the Temperature of the mercury. The reduction of the Barometer to 32° is made by the formula $t - 32 \times .003 \frac{B.}{30}$ and a constant ·030 added for capillarity.

H. B.

Note.—On referring to my manuscript meteorological table for the month of March, I find that an error of ·05 has been made in the printed entry of the two barometers at 10 A. M. on the 21st, which should stand 29,899 and 29,947. After correcting these, it will be found that to reduce Mr. BARROW's observations to terms of the barometer I have hitherto registered ·015 must be added to the corrected column at 32°: and to compare them to the new standard by NEWMAN ·029 must be deducted.

These discrepancies are nothing more than index errors; but as it is a matter of some importance to know which gives the correct altitude, and why an instrument commissioned with such precautions from the best maker at home should stand three or four hundredths of an inch *lower* than tubes made, filled, boiled, and measured in Calcutta; I have with Mr. BARROW's aid remeasured the scales of the several instruments respectively from 0 to the 30 inch mark, by a standard brass scale of TROUGHTON's at the temperature of 95°.

Mr. BARROW's scale was laid off by himself exactly.....	30,000 inches.
My compensation barometer to a scratch on the glass originally marked by myself with the same care, was found on remeasurement to be quite correct.....	30,000
NEWMAN's Strd. 1st trial 29,658 + 1,176—0,814 = 30,020	
2nd do. 28,746 + 1,176 + 0,100 = 30,022	30,020
3rd do. 28,848 + 1,176 = 30,018	

The principal difficulty in measuring the column of NEWMAN's instrument was to find the distance from the lower end of the ivory cone (or the level of the mercury in the cistern) to the upper part of the cistern: this I made by several trials 1,173 to 1,176; Mr. BARROW made it 1,182 and 1,183; Mr. PEARSON 1,172: I have taken it at 1,176 as the mean, and feel confident the error of the whole measurement does not amount to 0,005 inch. The readings therefore of this instrument in every instance will be ,020 too low.

I am reluctant to suppose Mr. NEWMAN should have sent me a barometer at such a vast cost so carelessly verified; but such seems to be the case from the above measurement, which is confirmed by the register; for allowing ,009 for the expansion of the brass scale, and adding it to the index error above, we find almost the exact amount by which the new instrument stands lower than my former standard, which latter has been compared by three opportunities with the Royal Society's barometer and found to agree very closely. Mr. NEWMAN neglected to make this comparison, although I particularly requested it.

J. P.

X.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 4th May, 1836.

The Hon'ble Sir EDWARD RYAN, President, in the Chair.

In reference to the resolution of the last meeting, the President stated, that he had addressed the following letter to the Governor General, whose acceptance of the office of Patron he had now the pleasure to announce.

Asiatic Society's Apartments, May 2nd, 1836.

MY LORD,

I have the honor to inform you, that at a Meeting of the Asiatic Society, held on the 6th April last, it was resolved "that the Right Honorable Lord AUCKLAND should be respectfully solicited to accept the office of Patron;" and it was further determined, "that the President of the Society should be requested to communicate their wish to his Lordship, and to ascertain his pleasure on the subject."

As President of the Society, I have the honor to communicate their wishes, and respectfully to request you will inform me whether it is your Lordship's pleasure to accept this Office.

I am, My Lord,
Your Lordship's most obedient servant,
E. RYAN.

The Right Hon'ble LORD AUCKLAND.

Government House, May 3rd, 1836.

SIR,

I have to acknowledge the receipt of your letter, and to assure you, that I gratefully accept the honorable title of Patron of the Asiatic Society, and shall be glad if, at any time, I should find it in my power to promote the objects of so excellent and so interesting an Institution.

I am,
Most faithfully, &c. your's,
AUCKLAND.

Hon'ble Sir EDWARD RYAN,
&c. &c. &c.

Lieut.-Col. CAULFIELD, proposed at the last Meeting, was ballotted for, and unanimously elected a Member.

Mr. R. W. G. FRITH was proposed as a member of the Society by Mr. JAMES PRINSEP, seconded by Mr. W. MARTIN.

Mr. WILLIAM BRUCE, proposed by Mr. PEARSON, seconded by Babu RAM COMUL SEN.

Mr. JAMES PRINSEP proposed Dr. LUMQUA, as an Honorary Member on the occasion of his return to China, seconded by Dr. CORBYN.

Read a letter from J. C. MORRIS, Esq., Secretary Madras Literary Society, acknowledging the receipt of the Index, and the Oriental Works lately transmitted.

The Secretary submitted to the Meeting the Proceedings of the Committee of Papers and Museum Committee, relative to the system of paid Curatorship, of which the experimental year sanctioned on the 6th May, 1835, had just expired.

[These proceedings are given at length below.]

The President reminded the Meeting of the alternatives suggested by the Report of the Committee: Members were to determine whether a paid Curator should still be maintained, under the certainty of the income of the ensuing year not being sufficient to cover even the ordinary expences, including the volume now in the press;—whether donations could be reckoned upon;—or whether the vested capital should be touched. Babu RAM COMUL SEN had proposed, that the latter should be devoted to the publication of the Researches, an application which might accord with the original intention of the donors. There was still an alternative—would any zealous Member undertake to look after the Museum gratuitously? All other offices in the Society were gratuitous; the Secretary, the Treasurer, although their labours were very heavy, even the Librarian, Dr. BURLINI, received no pay. If none offered to lend their aid, it

was evident they must have a paid Curator, if the Museum, which was so essential to the prosperity of the Society, were to be maintained at all.

Babu Ram Comul Sen explained, that the invested sum of 17,000 Rupees was part of a legacy of 20,000 by the late Mr. Bruce; this sum the Society had resolved to reserve, and to devote the interest of it to the printing of the Transactions; he therefore now wished to see the sum made up to the full amount once more; the interest 1000 per annum, would pay for the publication of a volume in four years, about the average hitherto issued.

The Secretary had, with the President, misunderstood his colleagues' meaning in Committee; he seconded his motion now most warmly; as long as the principal remained, it put the Society beyond the danger of dissolution: even if deserted by all its Members, there was a fund to keep up the rooms, the library, and the name of the Institution at least.

The publication of the present volume was the chief cause of the deficit in our budget: it would be an expensive volume from the number of plates; but the prosperity of the Society was even more concerned in the immediate and full publication of the fossil discoveries in Northern India, than in the maintenance of the Museum. It should be remembered, that M. Bouchez, the Assistant and Working Curator, would be competent to set up all new specimens, and preserve the present collection; and could Dr. Pearson be persuaded to lend his gratuitous supervision for the next year, after that the printing might be suspended, and he might again be put on pay. There was still another plan by which 1200 rupees might be saved, that of making Members pay for the Journal now issued gratis to them, or rather paid for out of the general fund.

Captain Pemberton and Dr. Corbyn considered the support of the Museum as a main cause of the Society's flourishing condition, and thought it would bring an accession of Members that would cover the expence; they therefore moved as an amendment:—

Resolved, that with reference to the probable advantages in a pecuniary way to the Society, from the continuance of the Museum, and in the absence of any other alternative, it is expedient that the Curator's establishment should be maintained another year on the present scale; and that the funds necessary for its support, in case of a deficiency of income, should be supplied from the money now invested in paper.

The amendment was carried by a majority of seven to five, the President not voting.

Library.

Read a letter from His Excellency General Saint Simon, Pair de France, Governor of the French establishment in India, forwarding on behalf of Monsieur Garcin De Tassy, a copy of his edition of the text of *Kámarúpa* in Hindustani, of which he had before presented the translation; with other copies for distribution.

Journal Asiatique, Nos. 85, 86, 87, 88, were presented by the Asiatic Society of Paris.

Madras Journal of Literature and Science, Nos. 10 and 11, were presented by the Mad. Lit. Socy. and Auxiliary of the Royal Asiatic Society.

Meteorological Register for March 1836 —*by the Surveyor General.*

The Indian Journal of Medical Science, No. 5—*by Dr. F. Corbyn.*

Read a letter from Dr. Lumqua, presenting to the Society 352 volumes of valuable and useful Chinese books, of which the following is a catalogue.

No.

1. 5 vols. *Tai hók chung yong*, 1st vol. works of the grandson, *Tsü-sü*, and of a disciple of Confucius.
 Shiong-lon-hár-lon, 2nd and 3rd vols. Confucius' conversation with his disciples.
 Shiong máng-hár-máng, 4th and 5th vols. ditto grandson's scholar's work Mang.
2. 5 vols. *Tai hók chung yong chíi*, &c. Explanation of the above, 5 vols.
3. 3 vols. *Hao-king*, Confucius' works on moral duties.

4. 3 vols. *Shi king,*
5. 7 vols. *Shiu king.* } Ancient records collected by Confucius.
6. 6 vols. *Lai ki.*
7. *Chan-tsao,* Confucius' works, moral tales.
8. 2 vols. *Ká yü,* Ditto and his disciples' conversations on the creation.
9. } 32vols. *Honghi tsü pèn,* Chinese Dictionary, by the Emperor of Honghí,
10. } 130 years since.
11. 8 vols. *Y-shap yat tsü,* Chronology of Kings' Ministers from the beginning to the Ming dynasty inclusive.
12. 10 vols. *Qontung-san yü,* Statistics and Customs of the Canton provinces, a new work of some reputation.
13. 32 vols. *Kad Tai Sing,* Laws of the Tai Sing dynasty.
14. 14 vols. *Po-ong.* Cases, arguments, and royal decrees of the present Emperor.
15. 4 vols. *Sai-un-lok,* Collection of difficult cases, with decisions.
16. 5 vols. *Lóng-to kung-ong,* of the same nature.
17. 4 vols. *Tsang sai un lok,* additions to No. 15.
18. 38 vols. *Shan-sen-thang kán,* history of gods and saints.
19. 1 vol. *Yau-fo-chí nám,* the compass of childhood, (on their diseases.)
20. 5 vols. *Kam-kám-moë fo,* on Anatomy and Surgery, with prescriptions.
21. 1 vol. *Yau fo fát faï,* (Director of childhood,) medical.
22. 6 vols. *Yau fo tsap shin,* Collections of all the authors on diseases of childhood.
23. 6 vols. *Y-fong pon cho,* a glossary of medicaments and ailments.
24. 8 vols. *Wán ping foë chhan,* prescriptions for the cure of every case surgical and medical, of all ages.
25. 4 vols. *Ná chan phèn,* on the moral preservation of the life, and on sanctification.
26. 6 vols. *Chhang tsü sing cha yet shü,* Chang tsu sing on horoscopy, or selection of fortunate days for building, marrying, &c.
27. 6 vols. *Puk-yik,* on fortune telling.
28. 9 vols. *Son-fá,* the accountant's guide.
29. 2 vols. *To-tak-king,* book of the To (philosophers) religion.
30. 8 vols. *Wud-fát-tay-shing,* book of synonymes.
31. 6 vols. *Kong-sü-loi fú,* complete epitome of Natural History.
32. 5 vols. *Shing yü hao,* mythology of heaven, earth, animals, mankind, (a kind of Lempriere,) for enriching language, with anecdotes.
33. 2 vols. *Ying-ná,* abridged general history.
34. 8 vols. *Yong chi tsuin chü,* Yong chi's collection of poetical extracts.
35. 4 vols. *Chó-tsü,* specimens of elegant prose writing, by Cho-tsu.
36. 15 vols. *Mán-tsuin,* collection of best essays.
37. 4 vols. *Tsám long tsüng tsüi,* ditto of best poetry on the affections.
38. 10 vols. *U-mán.* Best specimens of ancient composition.
39. 5 vols. *T'hong-tsü.* Poetry of the Thong dynasty.
40. 7 vols. *Y-wai-tsáp.* Poetry adapted to expression of feelings.
41. 4 vols. *Chung-wá-fung tso kthong.* Customs of the Chinese empire.
42. 5 vols. *Shü-pan.* Forms of petitions, letters, &c.
43. 20 vols. *Lao-tsing san tsáp,* (a new work,) customs, ceremonies, letters, &c.
44. 4 vols. *Kaï-yán-y.* A poetical book of jests.
45. 5 vols. *Sü-shi king mant shi.* Novelties of the four seasons.
46. 2 vols. *Sit-yok.* Gems of good writing.
47. 4 vols. *Tson shan.* Chinese Directory of general knowledge and court guide of salaries, &c.

The following Burmese and Talain manuscripts were presented by Capt. W. Foley :

		Language.	*Character.*	
No. 67.	Vajira Buddhi Tíká,	Páli,	Barma...	312 p.
68.	Wessantara játaka, Danakhanda 3rd,	Páli-Talain,	Talain. ...	64 p.
69.	Ditto. ————, chha khattiya	ditto,	ditto.....	40 p.
70.	Ditto. ————, ditto,	ditto,	ditto.....	34 p.
71.	Janaka játaka, ditto,	ditto,	ditto.....	52 p.
72.	Tika nipáta, ditto,	ditto,	ditto.....	48 p.
73.	Patthána, ditto,	Páli,	Barma. ..	672 p.

PASCHAL AUCHER's Armenian translation of MILTON's Paradise Lost, was presented by Mr. JOHANNES AVDALL.

Mr. HODGSON, Resident in Nepál, forwarded to the Secretary several specimens of the drawings prepared for his proposed Illustrations of the Geology of Nepál.

Subscribers had held back from patronizing his work because no mention is made of price in Mr. H.'s Prospectus. Without consulting publishers at home, this cannot be done with any certainty; but as a guarantee that the charge shall be *below actual cost*, Mr. HODGSON states that he is willing to devote 3000 rupees towards the publication, of what has already cost him so much to accumulate. Any subscriber may withdraw hereafter should he disapprove of the terms; in fact, as he quaintly but truly observes, he does not seek to put himself under obligation to others, but rather *others* under obligation to *him*, by his devotion of time, labour, and money to this grand object*.

Resolved, that the Asiatic Society subscribe for two copies of Mr. HODGSON's work, and that the Prospectus be circulated among its Members.

The Second volume (or rather the preface) of the *Sairul Mutakherín*, was presented by Maulavi ABDULMOJID the editor and publisher.

Museum and Antiquities.

An elephant's tooth, carved all over with images of *Gautama*, an object of considerable curiosity and antiquity, procured in a cave near *Moulmein*, was presented by Captain W. FOLEY.

Dr. WALLICH presented in the name of Captain BOGLE, a wooden standard taken from the Bhotia army.

(See Plate VI. fig. 4.) It is a bit of plank mounted on a staff, painted red, with an image of Buddha, belligerent (?) on one side, and a Tibetan inscription on the back, (copy of which has been sent to Mr. CSOMA KÖRÖSI for translation. "The Demangari Rája always had it carried before him with great solemnity, and under the special keeping of a large guard of honor, who however in the affair of Subang-kotta ran away without it, and it fell into our hands."

A Burmese musical instrument was presented by Ensign PHAYRE.

A small antique Persian image, dug up by a peasant near Bushire. By Capt. J. HEUNELL. This is depicted as fig. 3, of Plate VI.

Mr. AVDALL presented three Arsakian and one Sassanian coin.

Literary.

Read a note from JOHANNES AVDALL, Esq. on the reverse legend of some of the Indo-Scythic coins found by Mr. C. MASSON at Begrám in the Kohistán of Kábul.

A census of the Armenian population of the city of Calcutta was also presented by Mr. J. AVDALL.

Read a letter from Ensign NEWBOLD, forwarding for presentation to the Society an account of the 3rd of the four Menankábowe states on the Malay Peninsula.

Read a letter from Major JAMES LOW, dated Province Wellesley, 10th February, forwarding two manuscripts on Siamese literature, games, and music, and on the nature of the Siamese government, with specimens of Burmese and Malayan music.

* In any *other* country it would be termed *national* object, but *here* such a term might be misapplied! In France, the Government, alias the *nation*, publishes M. JACQUEMONT's works,—purchases M. VENTURA's collections,—devotes an annual grant to the Asiatic Society of Paris of 12,000 francs, as part and parcel of the national instruction system.—We need not pursue the parallel.

These manuscripts form a part of a mass of papers which the author had compiled many years ago, with the view to giving a connected account of Siam. The publications of Mr. CRAWFURD and others on that country, which satisfied public curiosity then, caused him to lay them aside ; the present however contain facts either new or more circumstantially detailed than hitherto.

A brief description of Masud, or Farid Shakarganj, was received from Munshi MOHAN LAL, at *Déra Ghází Khán.*

Physical.

Captain W. FOLEY submitted a paper, illustrated by specimens, and a map of the geology of the country in the neighbourhood of Maulmein, (correctly *Maulamyeng.*)

It was from a cave in the limestone range on the left bank of the Gyeng river, the *Damatha cavern*, that the elephant's tusk, carved with images of *Buddha*, and the Pali manuscripts above mentioned, were obtained.

A paper by B. H. HODGSON, Esq. on three new species of Paradoxurus, found in the Nipál valley, was submitted.

A collection of 148 mounted birds, six birds' nests with eggs, six mammalia, one reptile, and the head and legs of various birds, were presented by R. INGLIS, Esq.

These formed part of the Macao museum lately abandoned. It had been proposed to transfer the whole collection to Calcutta, and as far as concentration is beneficial, it is to be regretted that this munificent intention had been abandoned.

A collection of mounted birds, procured by the Curator, in the neighbourhood of Calcutta.

Specimens of shells, presented by WM. BRUCE, Esq.

A stuffed Alligator, preserved and presented by Dr. EVANS. A small specimen was also exhibited to the Meeting by the same gentleman, who remarks :

" This is a specimen of the broad-nosed species, common to most parts of India, and the kind generally found frequenting old tanks, jheels, and nallahs, and that seldom attains to any very large size. It measures eight feet two inches, and is evidently not a very young animal.

" In comparing it with the small specimen in the glass case, which was taken alive from the Hooghly, it would appear to be a distinct species ; as I find a considerable difference in the proportionate length of the tails of the two animals, and also in the number of the spinous processes, the large, having only 35 from the insertion of the thigh to the tip of the tail, while the smaller has 42. The number of carinated tubercles on the neck varies also, but this latter deviation may arise from difference of age or other circumstances ; they both correspond as to number and position of their teeth, the upper jaws having 36, the lower 30, and so disposed as to alternate with each other when closed : the larger animal has again two perforations at the extremity of the nose for the admission of the two long sharp teeth of the lower jaw, which are not perceptible in the smaller one.

" Both have the power of diffusing a strong musky odour when irritated, and which I find is derived from two glands opening externally, and situated on the inner side of the ramus of each jaw."

A skull of a Chinese, presented by Mr. W. CARR.

An Albatross, and a collection of shells and insects, presented by Mr. J. T. PEARSON.

Proceedings of the Committee of the Papers and the Museum Committee, assembled at the Asiatic Society's Rooms on Friday, 29th April, 1836.

The Curator read the following Report upon the Progress of the Museum during the last year :

In reporting on the present state of the Museum, we must revert to what it was last year, when the Society appointed me its Curator ; in order to enable you to form an opinion as to the usefulness or otherwise of that appointment.

Many here present may recollect at that time the general bad state of the Museum; the dark and dirty condition of the cabinets; the want of arrangement of the specimens; and the dampness of the apartments containing them; altogether giving a deplorable proof of neglect: and few who do recollect this, will, I hope, be inclined to doubt that a great improvement has been effected.

The first step was to divide the Museum into two distinct parts; one consisting of the works of art; the other of the productions of nature. The numerous valuable specimens of the former, being lost in the rooms below, were removed into the entrance hall, stair-case, and gallery, where they now are, and where they are seen, as we all know, to the greatest advantage: and their removal allowed of the apartments they occupied being entirely devoted to the Natural History portion of the Museum.

On examination, the specimens of Natural History were found, for the most part, in a very neglected state. In osteology, they were numerous, and some of them very valuable; but many were more or less mutilated, and the teeth of the skulls lost; while no catalogue, nor even memorandum, of the greater portion could be found. The first care was to remedy this: the broken specimens were repaired, so far as they could be repaired; and a catalogue was made, which includes every thing concerning them, that can be gleaned from the Researches, and other quarters; whether, as to the specimens themselves, or the names of the donors. In making this catalogue, some difficulty was experienced from the want of any notices of the specimens; and from there being no objects of comparison, by which to discover the species of an animal of which we had, perhaps, but a horn, or a single bone.

While this was going on, attention was also directed to the formation of a cabinet of reference to compare the fossil remains, in which the museum is so rich, with the living congeners, of the animals to which they belonged. This is, in its very nature, a tedious and laborious work; but already there have been articulated and set up, skeletons of a monkey, weasel, cat, rat, musk-deer, horse, parrot, and tortoise. The rhinoceros, which was before but badly put together, has been made the most of that its condition would allow; and an elephant's skeleton; and those of another horse and tortoise are being prepared. As this branch of the museum is of the greatest importance, I am anxious to render it as complete as possible; and with this view, have written to various individuals, likely to further our object, who have promised the bones of the camel, wild buffaloe, large deer of various kinds, the large bullock of Upper India, the tapir, and the alligator; and we may expect soon to receive them.

The most valuable specimens in the osteological section of the museum are, the skulls of the Malacca tapir; the Dugong; the Van Diemen's Land tiger, (whose dentition has been heretofore mistaken in all works of Natural History, until it was corrected in a paper, published last year in the Journal of the Asiatic Society, written from this very specimen;) and the jaw-bone of the gigantic ape shot by Capt. CORNEFOOT in Sumatra; a specimen unique, and valuable as the most lasting, and most striking remains of an animal so strange, that did not this exist, the whole story might be looked upon as a fable.

The specimens of mammalia are but few in number, and their condition on my taking charge was any thing but satisfactory. Some were in such a state of decay as to admit of nothing being done to improve them. Such was the case of the Thylacinus Cynocephalus, (Van Diemen's Land tiger,) to which I before alluded, its skull and paws having been all that could be retained,—a circumstance, however, in the individual instance which turned out fortunate, as thereby its dentition was discovered. This department of the Museum is increasing, and in a few years I hope it will be worthy of the Society.

In ornithology, although the specimens were rather numerous, their condition was so bad that four-fifths were thrown away. But great accessions have been made during the year; and we are promised specimens from all quarters. I have myself procured in the neighbourhood of Calcutta more than 100 birds; and these, together with several valuable donations, have put the ornithological department on a tolerably respectable footing; and I am therefore proceeding with the catalogue. This catalogue I propose to make something more than a mere numerical one, having been favoured with the valuable notes of Mr. C. W. SMITH, with liberty to make extracts from them; which, together with my own

observations during several years, will enable me to correct many errors, both of description and habit, that have been committed by the best naturalists regarding the birds of India. I may here state, that by following this plan, the Catalogue of the Museum of the Asiatic Society may be made a work of authority, such as to do credit to the Institution by which it is published.

The reptiles in the Museum are numerous and valuable; but they cannot at present be properly displayed, owing to the want of jars, in which to place them. Among them are many of the rarer Indian serpents. To my friend Lieut. CHIENE, the Society is indebted for many specimens during the past year.

In fishes the collection is not very extensive, though it contains some of the rare kinds. These also cannot be shewn, until our supply of jars and bottles shall arrive from Europe. In this branch, Lieut. MONTRIORE, of the Indian Navy, and Mr. SHAW, of the Surveying Vessel Flora, have been the principal donors.

There was no cabinet of insects belonging to the Society. The whole of the specimens in this department consisted but of a few preserved in spirits; and those purchased along with the Sylhet collection of shells. During the rains I employed my servants to collect; and they procured what may be considered a fair sample of the Bengal Coleopterous and Hemipterous insects of the season. They consist of very many genera and species, and in individual specimens amount to several hundreds in number. The collection is purposely rich in duplicates, to allow of some being placed in the cabinet of the Society; and sent to various societies and scientific men. I am also selecting for the Society's cabinet a series of duplicates from my own; which, as it is the result of the labour of nine years in Bengal, Behar, and Orissa, contains many specimens but rarely to be procured. At present our whole collection is scarcely large enough for systematic arrangement; the specimens therefore are placed according to their locality and donors; a plan which has also the advantage of marking their geographical distribution.

The American land and fresh-water shells, presented by Dr. LEA, and those from Sylhet; together with a few specimens presented by Lieut. HUTTON, and a small number of marine shells, composed the Society's collection of shells. We have also had a few presented during the year; and I have been enabled to add considerably to this branch of the Museum, by collecting the land, fresh-water, and marsh shells of the neighbourhood of Calcutta, and by transferring duplicates from my own cabinet.

I may sum up this part of the report by stating, that, during the past year there have been added to the Society's Museum, in osteology, 19 crania, nine complete skeletons, and between three and four hundred detached bones of various animals; 12 specimens of mammalia; 133 mounted birds; from 30 to 50 reptiles, and 15 fishes; in all upwards of 500 specimens of the vertebrated animals; and of the invertebrata, we have had 150 shells, several crustacea, and several hundred insects: that many of these are rare and valuable; many as yet undescribed, and one bird, the Urinorynchus Griseus, is all but unique.

To facilitate the collection of specimens for the Museum, a paper of brief directions for collecting and preserving them was written: this has been extensively circulated. A paper on the same subject was also composed, in which ample details were given; and this was published in the Journal of the Society. We are now reaping the benefit of these instructions, and we shall do so still more as the seasons for collecting come round.

With reference to catalogues, I have before stated that, that of the osteological section of the Museum is now in the printer's hands; as is also that of the mammalia. The catalogue of the birds is in progress; and in consequence of the aid I shall derive from Mr. SMITH'S notes, it will, I trust, be valuable when completed. That of the reptiles and fishes cannot be undertaken until we have the means of displaying those objects. That of the shells must be delayed until the promised description of the land and fresh water shells, by Mr. BENSON, shall be published. In the mean time, no want of a catalogue will be felt in this branch of the Museum; the name of each specimen being written, together with its locality, on the ebony tablet, upon which the shell is placed.

One very important object to the Society is, I conceive, to become the means of extending a knowledge of the natural productions of India, to scientific men in other countries. I have prepared duplicate specimens of land and fresh-

water shells to send to England, France, America, the Cape of Good Hope, and the Isle of France. I have also prepared duplicate specimens of insects from my collection, to send to various scientific societies and individuals in England. And I have sent some specimens of birds, purchased in Calcutta, to a gentleman, Monsieur VIROT, who is celebrated for his labours in Taxidermy at the Cape. These were transmitted through Sir CHARLES D'OYLY, who had kindly undertaken to forward them; and I took the liberty of sending them in the name of the Society; though, of course, as I was unauthorised to do so, I did not burthen the Society with the expence of the purchase. It has been proposed to Monsieur VIROT, to send African birds to our Museum in exchange, and Sir CHARLES has no doubt of his acceding to the proposition. Should he agree, the Society will perhaps give me permission to forward to him the duplicates now upon the table.

With reference to the financial part. Of the 50 rupees monthly for contingencies, I have given 40 to M. BOUCHEZ for his assistance; and subsequently increased his salary to 50 Compy.'s rupees, by reducing my own from 150 Sicca to 150 Compy.'s rupees; by this the Society also is a gainer to the amount of a few rupees. Of the sum for contingencies, all has been expended, and about 180 in excess. This sum I am prepared to refund, should it be thought proper for me to do so.

It was stipulated, that I should give up my occupation as Editor of the India Journal of Medical Science; and that I should rent a house near the Society's, if procurable, or entertain the means of daily attendance. I gave up the Editorship of the Journal on the publication of the number following my appointment. But with regard to the house, I found insurmountable difficulties in the way; none being procurable but the one immediately opposite, and that at a rent far exceeding my means to pay. I had recourse, therefore, to the alternative, and my attendance has been regular, always once, and generally twice, a day.

With reference to the present year, (should my appointment be renewed,) I do not anticipate the expences will equal those of the past; the cabinets, being now nearly complete, I propose to finish the Ornithological and Conchological catalogues, and to arrange the fishes, reptiles, and insects. With Mr. PRINSEP's aid too, the fossil remains will be examined and the new ones described. While generally, the new specimens in various departments of the science will be prepared and arranged in the Museum, as they come in. We have reason to believe these will be very numerous.

Such have been the labours of the past year, and what I propose for the present. I could have wished to have done more, particularly in completing the catalogues; but the difficulties in arranging a collection of Natural History from the beginning, are greater than any one not conversant with them can imagine. In all departments there was here much to be done; and of some there was not a vestige when I took charge. The Museum will now, I trust, go on thriving, and be worthy the name of the Society to which it belongs. Its establishment, as a focus into which may be collected the natural treasures of the East, is an object I have long had at heart: before I was a Member of the Society, several years ago, I wrote to the President, and proposed what has now been accomplished, and what it will be my pride to be permitted to sustain. I intreat you to carry it on upon its present footing, for at least another year; when I am sure you will be as anxious for it to continue, as I am myself. The attention of mankind is now directed to the natural sciences, as is sufficiently proved by the publication of so many books concerning them; and none is more attractive than zoology. To the attention the Society has lately given to these sciences, the great increase of Members is to be attributed; an increase during the last year unparalleled in its annals; but which I believe will be fully equalled or surpassed in the present. Its reputation will also, I doubt not, be as much enhanced by the researches of its members in Natural History, as it has been, and is, by their labours in the learning of the East.

Gentlemen, upon this point I may quote the words of our illustrious founder, who said, that, the inquiries of the Society "will be extended to whatever is performed by man, or produced by nature." The former part of this prediction

our predecessors have accomplished with ability and success; it is our's to perform the rest. And safely may we prognosticate, that, under those who now direct its proceedings, the Asiatic Society of Bengal, will, not only fully uphold the reputation it has so well merited, by inquiries into whatever is performed by man: but, also maintain it, and increase it, by researches into the productions of nature.

J. T. Pearson, *Curator, Museum, As. Soc.*

Calcutta, 1st May, 1836.

Resolved, that the Report be adopted and presented at the next Meeting, and the excess of expenditure for contingencies above the sum noted on the 6th May, 1835, (about 200 rupees) be recommended to be sanctioned.

Resolved further, that the Committee are highly pleased with the arrangements adopted by Dr. Pearson in the Museum, and with the progress it has made under his supervision; and they have no hesitation in recommending to the Society a continuation of the same system which has proved so beneficial and effective during the experimental year.

The Treasurer, Babu Ram Comul Sen, having laid before the Committee a statement of the funds of the Society, and an estimate of the calls on them during the ensuing year.

Balance of Cash,	1,325	15	9			
Government Paper,	17,500	0	0			
				18,825	15	9
Number of Subscribing Members, 92×64=per an.				5,888	0	0
Estimated Receipts.						
Balance of Cash,	1,325	15	9			
Estimated Collections,	5,600	0	0			
Interest on Paper,	875	0	0			
Income,				7,600	15	9
Estimated Charges,						
Establishment and Charges,	2,875	0	0			
Cabinets for fossils, &c. (ordered),	310	0	0			
Journal Subscription,	1,200	0	0			
Repairs of the House,	200	0	0			
Printing 20th Volume,	3,000	0	0			
One month Curator's salary due,	200	0	0			
Excess on Contingent Bills of do. say,	200	0	0			
Total Charge,				7,985	0	0
Add Money advanced by the Secretary for Cabinets, &c.,				186	15	10
				8,171	15	10
Deficiency on the ensuing year,				571	0	1

Resolved, that upon the above view of the means of the Society, it does not seem possible to provide for the payment of 200 rupees per mensem, for the support of a Curator's establishment during the ensuing year, without encroaching upon the vested funds of the Society. The Committee therefore leave it for the consideration of the Members at large, whether some other means may not be adopted for raising the amount necessary for this very desirable object. Various plans have been suggested in Committee, such as;—1. reservation of the vested fund for the publication of the Transactions; 2. voluntary donations, from such members, as may be interested in the support of the Museum, and from the public; 3. charging for admission of visitors. These plans the Committee deem it advisable to leave open to discussion in the Society at large,

trusting that some expedient may be devised for upholding the Museum, which they do not think it will be possible to maintain in a state of efficiency without having a paid Curator.

EDWARD RYAN,
Chairman.

Asiatic Society's Rooms,
April 29, 1836.

XI.—*Miscellaneous.*

1.—*Postscript to the Account of the wild Goat of Nepál, printed in the Sept. No. of the Journal, page 490. By* B. H. HODGSON, *Esq.*

Carefully as I thought my account of the wild goat of Nepál, recently published by you, was executed, I find that there is one material error in it, viz. the statement that the species has only two teats or mammæ. A recent dissection of a fine male led to the notice of the fact that there are four teats, which fact was confirmed by the examination of two live females. There can, therefore, be no question that this species of goat has four teats: and the circumstance is so remarkable, that I propose to substitute the name Quadrimammis or four-teated, for the popular name of Jhâral, under which I described it. Deer are distinguished by four teats, goats and sheep, heretofore, by two; the intermediate genus antilope, by four or two, in the several species. Capra Quadrimammis vel Jhâral, by its four teats, offers a singular and unique approximation (in this genus) to Cervus; and another proof that the infinite variety of nature cannot be designated by our artificial signs and peremptory divisions. Antilope, Capra, and Ovis, how shall we contradistinguish them? Solid-cored horns, in the first, is no unerring mark: and now we have a species of the second, and a *beardless* species too, abandoning his congeners to ally himself with Cervus, quoad the number of mammæ.

2.—*Notice of the Basilosaurus, a new marine fossil Saurian, discovered in America. By* H. PIDDINGTON, *Esq.*

The discovery of this most gigantic fossil species is due to Judge BREE of Arkansas, by whom, in 1834, the first fossil vertebra was found in the marly banks of the Washita river, in the Arkansas territory. In the latter end of the year, more vertebræ, fragments of the lower jaw, &c. were discovered in Alabama, about 30 miles north-west of Chairborne; another portion of jaw, with several teeth; an os humeri, several immense vertebræ; numerous fractured ribs; a molar tooth; the extremity of a tibia; portion of the shoulder, pelvis, &c. &c. were now found: and recently (May 1835), another skeleton has been discovered, and a large collection of the fossil remains is promised. Near the same spot a specimen of the caudal vertebræ of the Mosaurus or Maestricht monitor was also found.

It is assumed, that the bones, though great disparity exists in their proportions and size, constitute portions of one species, and the structure of the lower jaw, which is *hollow*, place it amongst the Saurians as a lost genus. The comparative smallness of the bones of the extremities seem to indicate the tail as the principal organ of motion, and the superior extremities must have been fins or paddles.

The train of vertebræ extending upwards of 100 feet in length in one locality, and estimated to be 150 feet in the Arkansas specimen, shew, that this gigantic animal must have probably attained upwards of this length,

meriting thus most fully the name Basilosaurus; which our honorary member, Dr. HARLAN, Professor of Comparative anatomy to the Philadelphia Museum, has bestowed upon it. In the Transactions of the Geological Society of Pennsylvania, which I have placed upon the table for the inspection of members, previous to sending it up to Dr. FALCONER, is a detailed paper by Dr. HARLAN, and two beautiful plates, illustrating this splendid discovery.

H. P.

3.—*The Balloon.*

We should not be exercising due vigilance as editor of a scientific journal, were we to omit recording the first ascent of a balloon from the plains of Bengal on the 21st of the past month (March.) M. ROBERTSON, the aeronaut, a Frenchman, who had made sixteen previous ascents in various parts of Europe, came expressly to India for the purpose of astonishing the natives with the novel tomasha of a human being wafted out of sight into ethereal space in his fairy car: and such competition is said to have prevailed at Paris*, for the glory of being the *first*, that M. ROBERTSON was fain to hurry hither before the balloon itself was ready. The bad success of his attempt may be partly attributed to the imperfect manner in which this indispensable article was supplied here.

The local and pecuniary arrangements seem to have been very ill judged; the selection of a spot of difficult access, at the further end of Garden Reach, tended only to prevent those who had subscribed from attending; choking the only land road, and the river, with non-paying visitors, who expended, what would have amply remunerated the aeronaut, in conveyances thither! The distillation of the gas was effective, and the balloon rose well, but ere it had attained a mile of height, it was seen to return so rapidly earthward, that great apprehensions were entertained for the traveller's neck. It appeared to us that when M. ROBERTSON entered the car, and attached the valve-strings to the netting, the valve was pulled open, thus enabling the gas to escape freely from the first; for the silk was found quite sound at its return. The aeronant himself talked of a sudden collapse of the balloon from condensation of the gas; but this was a deception: when it began to fall rapidly, the resistance of the air below pressed up the slack of the balloon like an umbrella, and aided in driving out the gas from the open valve above; in fact, the car was supported in its descent as by a parachute, and could not consequently quicken its pace to any dangerous extent.

The experience of such an accident should very much aid to increase the confidence of the aeronaut; for it is plain that with a little contrivance the balloon may in all cases be made to act as a parachute on the loss of its gaseous contents. We trust the next ascent will be made under more auspicious circumstances, and we hope that it may be possible to turn it to some small use in a scientific point of view, by ascertaining at least the decrement of heat and moisture at increasing altitudes, as well as the height of the reverse current of the upper atmosphere.

[This notice could not find a place last month.—Mr. ROBERTSON has since departed for the more cheering prospects of an ascent at Lucknow.]

* This competition reminds us of the rivalry in America to supply us with ice, which has at last led to a confirmed and durable scheme for regaling us with that luxury at a very cheap rate. Having noticed at length the first ice cargo, we have thought it unnecessary to recur to the subject; but the completion of a permanent ice-house will enable us hereafter to judge, of the best mode of preserving the frozen element. The tan bed intended for this object, from becoming wet, had an opposite effect, and was indeed nearly the cause of a conflagration! while the carbonic acid gas extricated from its fermentation, killed a man who incautiously descended to examine the chamber.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of April, 1836.

Day of the Month.	Observations at 10 A. M.								Observations at 4 P. M.								Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Wet Barometer at 32°.	Aq. Ten. deduced.	Thermometer in air.	Wet-bulb Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	New Stand. Barometer red. to 32°.	Old Stand. Bar. at 32°	Wet Bar. at 32°.	Aq. Ten. deduced.	Thermometer in air.	Wet-bulb Depress.	Leslie's Dif. Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun on do.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	4 P. M.
1	29,830	,849	28,793	1,056	80,5	5,7	4,5	95	29,697	,740	,450	1,290	88,1				71,2	105,0		o.	sw.	sw.	mist.	fine.	fine.
2	,829	,859	,725	1,134	81,4	11,6	10,1	81	,725	,760	,416	1,344	89,1	12,5	12,6	77	69,8	99,5		sw.	sw.	sw.	clear.	do	do
3	,874	,905	,722	1,183	82,4	14,2	10,8	80	,738	,780	,437	1,343	87,3				68,2	119,3		NW.	nw.	sw.	do	do	do
4	,849	,879	,790	1,089	82,4	5,8	5,0	94	,738	,779	,459	1,320	87,8	13,7	11,8	79	70,0	104,2		sw.	sw.	sw.	hazy.	do	cloudy.
5	,819	,863	,748	1,115	85,7	9,8	8,3	85	,661	,704	,430	1,274	87,6	12,1	10,6	82	66,8	96,7		E.	se.	se.	storm rn.	do	cumuli.
6	,774	,800	,730	1,070	82,2	6,5	4,9	94	,645	,683	,330	1,353	89,0	19,6	18,3	64	73,3	111,0		sw.	sw.	se.	scud.	do	do
7	,809	,837	,622	1,215	85,5	7,1	6,0	93	,686	,734	,285	1,449	90,9	12,5	11,0	83	74,4	106,2		SW.	sw.	sw.	cum.	do	hazy.
8	,829	,869	,691	1,178	85,4	5,6	5,1	96	,692	,742	,341	1,401	90,3	8,6	8,7	89	74,2	105,4		SW.	sw.	sw.	clear.	do	do
9	,775	,795	,654	1,141	85,1	4,8	4,9	95	,626	,671	,227	1,444	90,8	14,7	16,2	70	73,4	129,3		ssw.	sw.	sw.	cumuli.	cum.	do
10	,806	,841	,599	1,242	86,3	5,4	5,4	94	,630	,731	,260	1,471	90,9	13,8	15,4	71	73,2	119,5		s.	sw.	sw.	clear.	clear.	do
11	,833	,861	,600	1,261	86,3	7,6	7,4	90	,672	,719	,225	1,494	91,3	15,1	18,4	65	74,5	131,3		s.	sw.	s.	do	do	do
12	,752	,783	,512	1,271	86,8	10,4	10,3	85	,587	,636	,130	1,506	92,3	17,5	19,7	61	73,7	126,2		S.	s.	sw.	do	do	do
13	,706	,735	,397	1,338	88,2	8,0	8,0	88	,534	,594	,063	1,531	92,9	12,4	12,0	81	74,6	115,4		S.	sw.	sw.	do	do	cum. cir.
14	,733	,775	,505	1,270	87,3	6,3	5,8	92	,574	,623	,161	1,462	92,1	10,2	9,9	84	75,1	101,8		S.	sw.	sw.	cumuli. nwr.	do	misty.
15	,811	,849	,662	1,187	84,5	8,0	7,3	89	,684	,727	,445	1,278	88,9	9,2	8,7	86	69,0	93,5		S.	sw.	sw.	heavy storm	do	cumuli.
16	,776	,811	,640	1,171	85,3	5,1	4,7	94	,643	,685	,240	1,445	91,2	8,4	8,3	86	72,2	106,8	0,06	SW.	sw.	sw.	storm cum.	do	fine.
17	,804	,840	,620	1,220	86,2	8,7	9,4	84	,687	,730	,390	1,340	88,3	10,5	11,5	80	69,8	125,3		sw.	s.	N.	cumuli.	do	do
18	,798	,837	,582	1,255	86,4	7,4	6,3	90	,660	,711	,147	1,564	92,7	17,8	19,0	56	74,5	124,8		s.	sw.	s.	clear.	do	do
19	,766	,813	,474	1,339	87,7	10,6	11,2	82	,618	,670	,078	1,592	93,8	17,2	20,0	54	75,0	129,2		w.	sw.	sw.	do	do	do
20	,724	,776	,408	1,368	89,1	8,9	9,8	89	,598	,659	,110	1,549	93,1	13,5	15,2	74	76,0	111,8		sw.	sw.	sw.	do	do	hazy.
21	,713	,752	,406	1,292	87,9	7,8	7,7	89	,571	,622	,049	1,573	93,3	24,4	23,2	55	75,7	117,2		sw.	sw.	s.	do	do	fine.
22	,667	,704	,441	1,263	88,1	8,1	7,0	92	,559	,619	,226	1,393	89,5	15,6	13,5	78	77,6	99,8		S.	s.	s.	cir. cum.	do	cumuli.
23	,637	,685	,346	1,339	88,2	9,2	8,8	88	,494	,559	,169	1,390	91,0	9,3	7,2	92	76,1	105,0		sw.	s.	sw.	clear.	do	threatg.
24	,639	,687	,408	1,279	87,1	9,3	8,2	90	,514	,569	,115	1,454	91,2	11,9	10,2	87	77,2			sw.	s.	sw.	do	do	nwr. dy.
25	,644	,685	,380	1,305	87,6	10,4	9,0	88	,551	,609	,098	1,501	92,7	11,8	10,0	84	74,2			sw.	sw.	s.	do	do	clear.
26	,700	,756	,447	1,309	88,5	8,8	7,1	91	,588	,646	,186	1,460	91,7	9,8	10,1	86	76,2	96,2		s.	s.	se.	do	cum. str.	fine.
27	,734	,790	,534	1,256	87,4	8,0	7,5	93	,597	,630	,201	1,429	91,1	11,1	10,9	87	74,2	104,0	0,11	E.	E.	sw.	haze.	cumuli.	cum. cir.
28	,737	,755	,541	1,214	86,8	7,9	6,8	94	,583	,630	,155	1,475	91,5	13,6	14,0		70,2	102,8		SE.	s.	sw.	clear.	clear.	mist.
29	,652	,681	,399	1,282	87,8	7,4	7,0	92	,500	,559	,060	1,499	92,7	10,1	10,5	85	72,0	102,8		s.	s.	sw.	do	do	cum. cir.
30	,651	,685	,398	1,287	87,7	8,1	8,3	87	,507	,553	,054	1,499	93,9	16,4	17,6	68	74,2	114,8		sw.	sw.	sw.	do	do	clear.
Mean,	29,755	,792	28,562	1,230	86,0	8,1	7,4	90	,620	,669	,231	1,438	90,9	13,3	13.3	77,0	73,5	110,9	0,17	SW. monsoon.			Frequent storms, dry.		

Newman's Barometer this month stands .037 at 10 A. M. and .049 at 4 P. M. lower than my former standard. To ascertain whether the fault was in the compensation tube by which the zero of the scale in the latter is corrected for temperature, this principle was dispensed with, and the instrument read in the common manner from the 27th inst.

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I.—*Johóle and its former Dependencies of Jompóle Gominchi. By Lieut.* Newbold, *A. D. C. to Brigr. General* Wilson, *C. B.*

Johóle. Of *Johóle,* the third of the four *Menangkábowe* states, still less is known than of *Rumbówe* and *Sungie Ujong.*

An Englishman of the name of Gray, (whose information is to be taken, however, with caution,) is said to have been the only European who has penetrated into the interior of this state. He passed through part of it in 1827, on his return to *Malacca* from *Pahang,* whither he had performed a journey overland, across the peninsula, to barter opium for the gold dust of the latter place.

His route lay through *Naning,* part of *Rumbówe, Srímenánti, Jampóle, Ulu Seruting, Ulu Braugh,* and *Ulu Pahang.* The journey was performed in 14 days.

From *Tabu,* in *Naning,* to *Jompóle,* he was four days passing over mount *Lanjut,* to the villages of *Gadang* and *Tanjong;* over mounts *Míko, Pabí,* and *Púnting Páhat,* through the villages of *Passir, Júno,* and *Píla,* in *Srímenánti;* and from *Píla* to *Jompóle,* " one day's walk."

Mr. Gray describes the country he passed through, to have been in a state of high cultivation, particularly at *Míko,* and in the vales of *Púnting Páhat, Júno,* and *Passir.*

He observes that the *paddy* at *Míko* is preferable to that of Malacca, and that it is supposed by the people that the ground there is better for cultivation, one *gantang* of seed never producing less than a hundred-fold.

The produce of mount *Míko* is sapan wood, dammer, and canes of the species termed Pinang-lawyers in abundance. *Jompóle,* he con-

jectures, to be about 90 miles distant from Malacca. *Pahang* is estimated at 300 miles distance from *Jompóle*. From *Jompóle* to *Pahang* the journey is by boat down the river *Seruting* to the large lake of *Braugh*, called *Tassek Braugh;* which is said by Mr. GRAY to be nearly fifty miles in circumference, and is formed by the flow of water from the neighbouring mountains.

If this account be correct, the lake *Braugh* exceeds in dimensions the recently discovered inland lakes in Sumatra.

The natives, however, have described this lake to me to be of much less extent; narrow but long. Its communication with the *Pahang* river, which empties into the China sea, is by a river called the *Braugh*.

Regarding the navigation of these rivers, Mr. GRAY observes: "In some parts of the *Seruting* and *Braugh*, a brig might go up, and in other parts, nothing but a small boat; on account of the water being above the fallen trees, so that the boat must be lifted before it can proceed, on account of the overflowing banks of the river."

The *Pahang* river, from the place where it receives the waters of the *Braugh*, down to the town of *Páhang*, is wide and deep. These streams are deepest in the months of November, December, and January. From the month of March to that of August, Mr. GRAY was informed, that it is impossible to proceed from the *Seruting* river to *Pahang*, on account of the paucity of water. The general depth of these rivers, in January, he ascertained to be between 40 and 60 feet; but on his return in February, he found their depth diminished by one-half.

There are a few villages on the banks of these rivers, but for the most part they are covered with lofty forests, tenanted by the rhinocerous, tapir, tiger, elephant, and scarcely more civilized *Jacoon*.

Mr. GRAY met with great kindness and hospitality from the inhabitants of the different estates through which he passed. He fell, however, a sacrifice to his exertions, dying of jungle fever, contracted during the journey, twenty-five days after his return to Malacca.

Boundaries.—Johóle is bounded on the north by *Ulú Pahang* and part of *Rumbówe:* to the south by part of *Naning* and *Múar* or *Segámet:* to the east by *Segámet*, and to the west by *Srímenánti* and part of *Rumbówe*. The boundaries with Malacca are from *Búkit Puttús* to *Battang* Malacca, and from *Battang* Malacca by *Bánkóng* Chóndóng* to Mount *Ophir*.

* *Bánkóng Chóndóng* is a large tree, growing in the forest that separates *Assahan* from Mount *Ophir*. The tree was still in existence when I visited Mount *Ophir* in 1833.

With *Segámet* and *Múar*, its boundaries are *Murbówe sa rátús* (the hundred *Marbówe* trees) and *Bánkóng Chóndóng;* with *Rumbówe, Búkit Pabí ;* and with *Srímenánti, Búkit Píla.*

Population, &c.—The population of *Johóle* is estimated at 2,080 inhabitants. The principal villages are *Nuri, Londong, Tney, Táman,* and *Bennong.*

Johóle is governed by a *Panghúlú* and *Ampat Súkú.* The former, like his brother chief of *Sungie Ujóng,* is elected by the *Súkús,* and by the *Bátin dú ablas,* or twelve heads of the *Jacoons.*

The name of the present *Panghúlú* is Abu Bekr, or Banchita, and his title *Johan Lélah Percásseh ;* he resides at *Nuri,* is an intelligent looking person ; plain, simple, and collected in manner, and much respected by his people.

The tribes are those of *Bodoánda, Sa Melóngan, Tiga, Battu,* and *Múnkal.*

Srímenánti and *Jompóle,* were formerly considered dependencies of *Johóle,* but now assert their independence, as also does *Gominchi.* The *Panghúlú,* Lessye, of the latter place died lately, and his brother Mahammed Kari succeeded him. *Póndok Passir,* a small state under the influence of *Srímenánti,* was also a dependency of *Johóle,* and is ruled by a petty *Panghúlú* of its own.

Besides the usual rights of revenue, the *Panghúlú* of *Johóle* levies ten per cent. on the produce of the tin mines, together with a tax on the gold of *Gominchi,* which will be shortly alluded to.

Trade.—The trade of *Johóle* consists chiefly in gold dust; 20 catties of which are said to be produced annually. Tin, about 300 piculs. Fruits, ratans, jaggery, and fowls are brought in considerable quantities down to Malacca.

Jompóle.—*Jompóle* was anciently a dependancy of *Johóle,* but is now nominally governed by Rája Allang, a son of the third *Menangkábówe* prince, Rája Ham. The *Panghúlú* and *Ampat Súku* exercise almost independent sway.

The name of the present *Panghúlú* is Hassain ; the tribes are those of *Bódoanda, Sa Melóngan, Anók* Malacca, and *Tiga Búttu.*

Jompóle is in the high road of the *Pahang* traders travelling across the peninsula to Malacca ; it is situated on a small river of the same name, which flows into the *Múar* river, [one of the largest streams on the western coast of the peninsula,] by which it has communication with the Straits of Malacca. By the rivers *Seruting* and *Braugh,* an easy intercourse from November or October to February is kept up with *Pahang* and the eastern coast. The Rája here levies a duty on the opium, tobacco, cloths, iron utensils, salt, &c. passing through

Jompóle to *Pahang*, as well as on the gold dust and silk cloths of *Pahang* returning to Malacca.

Jompóle produces a considerable quantity of tin, sapan wood, rice, dammer, ratans, and a little gold, which is sent down the *Múar* river to Malacca (eight days pull), and also to *Pahang*.

The population of *Jompóle* is estimated at 2,000; it is divided into three *Múkims;* viz. those of *Limbájon*, *Turúntong*, and *Qualla Lenney*.

Gold.—The following account of the gold mines at *Chimendros*, with the exception of the part relative to the assaying of the metal, which is from personal observation, is almost entirely drawn from native information.

Búkit Chimendros is a hill situated in *Gominchi*, a territory subject to the *Panghúlá* of *Johóle*, and bordering on the eastern frontier of *Naning*. It is covered and surrounded by an uninhabited forest of great extent, intersected by numerous rivulets, which derive their source from the hill.

Veins of quartzose rock run over it at various depths (generally from 12 to 20 feet) below the surface, forming the matrix in which* the gold is found in small broken streaks.

The rock is enclosed in a bed of a sort of white clay, indurated more or less, termed *Nápal*.

The method pursued by Chinese and Malays for separating the metal from its matrix resembles that adopted by the Hungarian miners, with this exception, that the process of amalgamation is not practised by the former for this purpose. The Kling assayers of gold, however, avail themselves of it in their vocation, as will presently appear.

The Malay miners, as soon as the precise spot and minute have been determined by their diviners, *Páwangs*, or other charlatans supposed to be skilled in discovering the hidden treasures of the earth, commence clearing the ground of trees, brushwood, &c. and then proceed to remove the roots and vegetable soil by means of *Biliongs* and *Chonkoles*, (the Malayan adze and spade,) until the bed of *Nápal* is laid bare. These implements are now put aside, and a heavy sort of iron crow-bar, *(Perjong)* is had recourse to.

The first layer of *Nápal* is soft and whitish; the second has a reddish tint. The last is a black incrustation resembling brick in hardness, and hence called by the natives *Tambíker Quáli;* this is commonly two fingers' breadth, in thickness, and being removed, discovers the

* A specimen of this rock, in which a small portion of gold is imbedded, or rather disseminated, has been forwarded to the Society.

white vein of rock, the matrix of the gold, and termed the *Beting*. It is generally between three and four feet in diameter: underneath lies a bed of whitish earth, below which gold is never found.

The next process is that of breaking up the *Beting*, for which purpose the *Perjong* is employed. From the extreme hardness of the rock this is a very laborious and tedious task. The coarse pieces are then pounded in a sort of large mortar cut from the quartz rock. The pulverized stone is then passed through sieves *(Kísye)* of ratan, and carried in small baskets to a running stream, where the smaller stony particles are washed away, while the gold dust, with the grosser pieces, sink to the bottom of the conical vessel in which it is subjected to the action of the stream.

The refuse is picked out, and the gold dust again carefully washed and collected in a cocoanut shell or leaf of the *Pallas* tree, and conveyed to the *Bongsal*, where it is dried by means of a red hot piece of charcoal being repeatedly passed over its surface. After the adherent finer particles of the sand have been removed, it is weighed into quantities, generally of one *tael* each, which are carefully folded up in small pieces of cloth.

These packets constitute the *Bunkals* of commerce.

In Sumatra, according to Marsden, the parcels or *Bulses*, in which the gold is packed up, are formed of the integument that covers the heart of the buffaloe.

The *Bunkals* are, as in Sumatra, frequently used as currency instead of coin.

The weights* for gold formerly used as *Chimendros* and *Taon* (a place about half a day's journey thence) are as follow:

2	small ságas (*Sága kechil*)	=	1 large sága (sága besár).
8	*Sága besár*, ...	=	1 *Maiam*.
16	Maiams, ...	=	1 Tael or Bunkal.
20	Taels, ...	=	1 Cattie.

The Sága is a sort of small scarlet pea with a black spot, the *Abrus Maculatus*.

Besides *Chimendros* and *Taon*, I have not heard of any place on the peninsula where gold is obtained from the solid rock. On Sumatra it is frequently found in this state.

The gold dust at *Pahang* and *Jellye* is procured in the same manner as that in the mines at the foot of Mount *Ophir*, already described in a paper published in this Journal; *(vol. ii. page 497.)*

The mines at *Reccan* are estimated to produce annually about 20 catties of gold dust.

* At Malacca 10 *Sága besár* or 4 *Kúpongs* are equal to one *maiam*.

The *Panghúlú* of *Gominchi* first levied a tenth on the produce of these mines, but in consequence of large quantities of gold dust being secretly carried off, before the tenth had been levied, he substituted a sort of poll tax, amounting to a *maiam* of gold per annum, from each person working at the mines.

The *Panghúlú* of *Johóle* is in the habit of sending five or six buffaloes a year to the mines, receiving for every head of cattle two taels of gold.

These heavy drawbacks have caused the mines to become unprofitable to the speculators, and almost deserted. The former of these imposts, I believe, could readily be endured; but the latter *ad libitum* sort of exaction destroys all hope of reasonable profit.

The following is an estimnte of the various degrees of purity of gold dust, produce of the peninsula. It will be necessary to premise, that *mútú*, is a term denoting the degrees of fineness for gold, of which there are 10, as fixed by the native assayers. Gold of 10 *mútú* is equal therefore to gold of 24 carats: gold not reaching eight *mútú* is called *mas múda*, or young gold; and gold from eight to 10 *mútú*, *mas túah*, or old gold.

Gold of *Reccan*,		$9\frac{1}{2}$ *mútú*
Mount Ophir,		$9\frac{1}{4}$,,
Chimendros and *Taon*,		$9\frac{1}{2}$,,
Pahang, *Jellye*, *Tringánu*, *Calantan*,		$9\frac{1}{4}$,,

From *Calantan* gold of 10 *mútú* is sometimes obtained.

The assayers of gold are generally *Chuliahs* or *Klings*, who acquire by constant practice the power of determining to the fraction of a *mútú* the purity of any specimen of gold dust brought from the eastward*. As they would be perhaps liable to imposition were this the only trial they subjected the metal to, they have recourse to the *Battu ují* or touchstone. This is a roughish black stone, apparently basalt, brought from continental India, and generally set in a small frame of bronze or brass.

The assaying needles are generally from 20 to 24 in number, ranged on a string, and alloyed in known proportions of copper and silver, marked on the surface, from three to $9\frac{3}{4}$ *mútú*. The needle and gold to be assayed are rubbed on the touchstone in parallel streaks, in the usual manner; a lump of the adhesive wax called *Lílin kalúlút* is then applied to the surface of the touch-stone, which brings off the two thin lamina of gold.

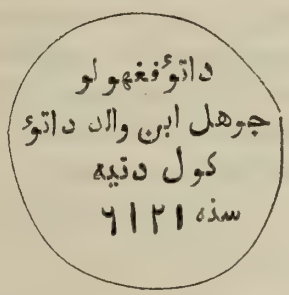
* The natives are, I believe, totally ignorant of the assay by cupellation and acids.

The difference between the two being more visible on the wax (which is coloured black for this purpose with a fine charcoal made from the plantain leaf) than on the stone. This is the reason the native assayers give for the removal of the streaks of gold from the stone to the wax, though to me no difference was perceptible: possibly the following may afford another clue to the practice of the natives in this particular.

In this wax the impressions of the gold, which would be lost on the stone, go on accumulating; a ball of it, which my native informant had used for the last 30 years, he supposed to contain above two *taels* of gold.

The metal is separated from the wax by means of heat applied gradually, in such proportions as barely to cause the wax to pass off in the form of smoke: the residuum is then subjected to the process of amalgamation. Half of the gold thus obtained is dedicated in alms to the poor, or on religious offerings, at the shrine of some favorite Saint or *Wali;* generally to that of Miran Sahib at Nagore.

The calculation of a Malay, long employed in the mines at *Chimendros,* makes the average quantity of gold produced from 40 lbs. of the pulverized stone, 24 grains of pure metal. Lumps of virgin gold, weighing from five to six *taels,* have been found in the alluvial soil here and at *Taon.* In *Jellye,* a mass weighing upwards of a *cattie* has been discovered: this will appear trifling if placed in comparison with that which Reaumur mentions as having been shewn to the Royal Academy at Paris, weighing 448 oz. Helms affirms that when one of the highest mountains of *Paraguay* fell down, about 50 years ago, there were discovered in it pieces of gold weighing from two to fifty pounds each.



Seal of Johóle, dated A. H. 1216.

[The date on the seal is reversed, a mistake that we have not unfrequently observed on Indian coins with Persian inscriptions. As this is the last Essay on the Malacca States with which Lieut. Newbold will be able to favor us, it may be as well to point out where the preceding are to be found:

Visit to Mount Ophir, ... vol. II. p. 497.
Account of Naning, ... ,, III. ,, 601; IV. 297.
Ditto the four Menangkábowe States, ,, IV. ,, 241.
Ditto Sungie Ujong, ... ,, IV. ,, 537.—Ed.]

II.—*Interpretation of the Tibetan Inscription on a Bhotian Banner, taken in Assam, and presented to the Asiatic Society by Captain* BOGLE. *By* M. ALEXANDER CSOMA KÖRÖSI. [*See Pl.* VI. *fig.* 3.]

[In a letter to the Secretary of the Asiatic Society; see also Proceedings of the Asiatic Society, 4th May, 1836.]

According to the request conveyed in your letter of the 30th April, I have translated the piece of magical superstition which you have faithfully transcribed from the Bhotian board. With exception of the salutation at the beginning and the conclusion, and a few terms in the middle, the whole is in the Tibetan language. The purport of it, as will be evident from the tenor of the translation, is, to obtain the favour and protection of several inferior divinities, to increase the prosperity, &c. of the person and family for whom the ceremony was performed, and this magical piece was erected or set up.

It may be that the flag-staff, with the wooden board containing this inscription, was carried before the Tibetan chief in his march, and so used as an ensign in war; but it is more probable that it belonged originally to the house top or terrace of the prince in Bhotan: for the houses of great personages in that country are generally decorated with such ensigns of victory at the four corners of the terraced roof. They are called in Tibetan རྒྱལ་མཚན *rgyal mtshan* (ensign of victory), and always contain inscriptions of similar purport with this.

In regard to the orthography of the piece, it frequently occurs in Tibetan writings and books, that the vowel signs are removed from their proper places, on account of the dependent letters of the line above; several cases of this occur in your transcript. The intersyllabic points at the end of a line are generally also omitted, except with the conjunction དང་ which will also be remarked here. I have made a copy in Roman characters, and have also endeavoured to make a literal translation: the words in Italics I cannot properly interpret.

Om svasti, pronounced by the Tibetians *om soti,* is rendered by them in their language ཨོཾ་ བདེ་ལེགས་སུ་ཐྱུར་ཅིག *om bdé-legs-su gyur-chig:* "Oh may it please, may it be prosperous."

Inscription on the back of the wooden Board (fig. 3. Pl. VI.)

ཨཱ།། ཨོཾ་སྭ་སྟི་ ཐུབ་ཆེན་རྣམ་བཅྱུད་ ཐམས་ ཆད་དང་
ལོ་བྱ་ཁག་ རྒྱ་ཚོགས་ལ་ དབང་བའི་ གཟའ་ སྐར་ ཆོས
ཐུ་ ས་ བདག་ ཐྱུ་ རིགས་ སོགས་རེགས་ པ་ གཙོ་ ལགོ

ཨཱཾ་མཉྫ[1] ཤ་ཀྱ་ལ།[2] ཀི་ཀད [3] བཅིངྷ་ རྒྱལ་ མཆོག
མ་ པི་ལིང་ ཁྲ་ ཆཱ་ ལོགས་ ཁཎྜ་ པོ་ འཕྲོ་ སྲིན་ དང་
ཕྱོགས་ མཚམས་ སྟེང་ ངོག་ ཁནས་པ་ རྣམས་ དང་
ཁྱོད་པར་ ཉི་མ་ དེ་རིང་ གང་ལ་ རྒྱུ་ བའི་ ས་བདག
སྣང་སྲིད་ ལྷ་སྲིན་ སོགས་ ཐམས་ཅད་ སྲིད་པ
ཧཱུྃ་ཕྱག་རྒྱ་ཤྲཱི་ལ་ ཏོས་ཤིག་ སྣང་སྲིད་ལྷ་སྲིན
སྡེ་བཙན་ ཁྲིད་ རྣམས་ཀྱིས། བྲག་པའི་བསྟན་པ
ལ་ཤག་ཏུ་ དད་པའི་ ཕྱོགས་སྐྱོང་ བའི་ བདག
པོ་ འཁོར་ དང་ བཅས་པའི་ ཚེ་དང་ཞོད་
ནམས་ དཔལ་ དང་ལྡན་ པ་ཐམས་ཅད
ཟླ་བ་ཡར་ཕྱི་ བཞིན་ གོང་ནས་ ཕེབ་ཅུ
འཕེལ་ ཞིང་རྒྱས་པར་ མཛད་ཅུ་ ཐལོ།
ཨོཾ་ མཎི་ ཨ་ཀ་ནི་ནེ་ཀ་ནི་ཨ་སྦྷི་ལ་མཎྜ་ལ
མནྟྲ་ཡེ་སྭཱཧཱ། སརྦམངྒལཾ།།

Om svasti Lha Srin *s*dé *br*gyad thams-chad dang
lo zla zhag dus ts'hés-la *d*vang vahi *g*zah skar ts'hés
lha sa *b*dag *k*lu rigs sogs drégs-pa *g*tso *h*khor
khyab-*m*jug (for *h*jug) Rahula (for Ráhula) ki-kang (for kañkar) Vis'hți dus *m*ts'han
ma *pi-ling khra ts'ha* sogs *g*nyan-po *k*dré Srin dang
phyogs *m*ts'hams steng hog *g*nas-pa *r*nams dang
khyad-par-du nyi-ma dé-ring gang-la *r*gyú vahi sa *b*dag
Snang srid lha srin sogs thams-chad srid-pa
Huhi phyag *r*gya *k*di-la *l*tos-shig, Snang srid lha srin
*S*dé *br*gyad khed *r*nams-kyis, Thub-pahi *b*stan-pa
la rab-tu dad-pahi *r*gyu *s*byor *s*byin-pahi *b*dag
po *h*khor dang *b*chas-pahi ts'hé dang *b*sod
nams *d*pal dang *h*byor-pa thams-chad
zla-va yar-gyi ño *l*tar gong-nas gong-du
*h*phel-zhing *r*gyas-par *m*dzad-du *g*sol.—
Om akani nékani abhila mañ'dala
Mantrayé Sváhá, Sarva mañgalam.

Translation.

O ye divinities! all hail!—(Ye) all the eight classes of the divine imps (S. Rákshasas); also ye gods, regents of the planets, constellations (in the path of the moon), and of the lunar days, having your

[1] For ཨཏྭ་. [2] For ཤཱ་ལྭ་. [3] For ཀཱཏཿ.

influence upon the year, the lunation (or lunar month), and the different seasons or periods; ye possessors of the earth or land (land-proprietors), all the eight kinds of the Nágas (Hydras), &c. Ye powerful chiefs and attendants, VISHNU RÁHULA, and the menial (instrumental cause) Vis'hṭi; ye goddesses (or nymphs) *pi-ling-khraa ts-'ha*, &c.; ye fierce inferior imps, who dwell in (or towards) the cardinal, intermediate, zenith and nadir points (or in the ten corners of the world); and especially ye divine imps, &c. who are rulers of those regions, wherein the sun this day is moving; ye all look on this emblem (seal, image, or signed writ, &c.) of HU, the regent or governor, (or set up, or erected by HU.) Ye divine eight principal imps (Rákshasas), rulers of the world (or keepers of light), I beseech you, that you will make that this patron, the bestower of charitable gifts, for obtaining the fruit of his works and actions, who is very faithful to the doctrine of the Muni (SHAKYA), may together with his household or family, increase more and more, and abound in life, fortune, (prosperity,) honour, and in all his substance or wealth, like the increasing face of the moon. *Om akani nékani abhila mandala, mantryé, Sváhá; Sarva mangalam.*

Tettelia, 9th May, 1836. A. C. KÖRÖSI.

III.—*Note on some of the Indo-Scythic Coins found by Mr.* C. MASSON *at Beghrám, in the Kohistán of Kábul. By* JOHANNES AVDALL, *Esq. M. A. S.*

[Read at the meeting of the 6th May.]

The results of the valuable researches of Mr. C. MASSON, Dr. MARTIN HONIGBERGER, Lieutenant BURNES, the late Dr. GERARD, and KERÁMAT ALI, in the vast field of the numismatology of ancient Bactria and other parts of India, must have excited a deep interest among the antiquaries of Europe. It must also be highly gratifying to the lovers of this important science on this part of the globe, to observe the unabated zeal and assiduity with which these researches are continued by eminent numismatologists, with a degree of success exceeding their most sanguine expectations.

Of the Indo-Scythic coins, discovered by Mr. C. MASSON at Beghrám, in the Kohistán of Kábul, and described in the 28th number of the Journal of the Asiatic Society, the one bearing the Greek legend NANAIA, has, it appears, attracted much attention. He is persuaded to think it to be identical with *Bibi Nanni*, or "the Lady NANNI," a name given by the Muhammedans to the numerous shrines or *Ziáráts*, as he calls them, found in those regions of Asia. The

Hindus also seem to attach to them a peculiar sanctity, claiming in the *Bíbí Nanní*, a personation of their favourite goddess, *Párbatí*. These are all, however, mere conjectures, the real meaning of the Greek legend remaining yet to be explained.

In a subsequent number* of the Journal of our Society, a far different explanation of the Greek legend is given by its indefatigable Editor, which is, perhaps, a near approximation to its true meaning. There the goddess NANAIA is represented to bear a close analogy, in name and character, to the *Anaitis* of the Greek, and *Anahid* of the Persian, mythology. This hypothesis is based upon the authority of STRABO, quoted by Colonel WILFORD. A goddess called by the former ANAIA, is considered by the latter to be equivalent to the Sanscrit *Anáyasá devi*. But, how far the deity, recognised under the one or the other appellation, can be supposed to be identical with NANAIA, remains yet to be ascertained.

Anahid was the tutelary goddess of Armenia, during its continuance in the darkness of idolatry. She is also known in our mythological works by the names of *Artemis* and *Aphrodite*, being supposed to have sprung from the froth of the sea, and descended from *Zevs, Aramazd* or *Jupiter*. *Anahid* or *Anaid* is considered by us to be identical with the planet *Venus*, and the letters composing it being inverted, it reads *Diana*, which is equivalent to *Artemis*, by which name the goddess of hunting is invariably designated throughout all the Armenian books treating of the ancient mythology of our country.

The word NANAIA, or *Nanæa* distinctly occurs in the second book of the Maccabees: "For, when the leader was come into Persia, and the army with him that seemed invincible, they were slain in the temple of *Nanæa*, by the deceit of *Nanæa's* priests†." It was in the compass of the temple of this goddess, that ANTIOCHUS the Great was put to death. She is also called Ննանեայ ANAIA, or Ննանեաս *Naneas*, the genitive of which, according to the Greek termination, is written Ննանեայ *Nanea*. It has its derivation from the Persian language, literally meaning *maternal* or *motherly*. To the honor of NANAIA, or *Nanæa*, many temples were raised in Armenia, the most magnificent of which, according to the authority of Ագաթանգեղոս AGATHANGELUS, existed in a village called Թիլն Thiln, situated in Upper Armenia. This idolatrous temple was razed to the ground by SURB GREGOR LUSAVORICH, and a splendid church erected in its stead. Սուրբն Գրիգոր Թագաւորաւն հանգերձ փշրեին զոսկի պաոկերան Անահտական դիցն.

* Journal of the Asiatic Society for September, 1834.

† II Book of the Maccabees, chap. i., v. 13.

և ամենևին զտեղիան քանդեալ վատնէին, և զոսկին և զարծաթն նուիրեալ: Եւ անտի ընդ գետն Գայլ՝ յայնկոյս անցանէին. քանդէին զՆանէական մեհեանն՝ դստերն Արամազդայ, ՚ի Թիլն աւանի. և զգանձս երկուց մեհենիցն աւար ժողովեալ՝ ՚ի նուէրս ոքք սպասու եկեղեցւոյն Աշ Թողին. տեղեօքն հանդերձ:* "Saint GREGORY and the king (TIRIDATES) broke down the golden images of the *Anahitic* deity, and reduced the temple to utter ruin, having divested it of the gold and silver belonging to it. Thence they crossed the river Goyle, and demolished the *Nanaiatic* temple, dedicated to the daughter of *Aramazd*, in the village of Thiln. The treasure contained in these two temples being collected, were appropriated to the sacred purposes of the church of God, to whom the spots were also consecrated."

By the authority of this ancient historian, a philosophical inquirer will be convinced of the similarity of the characters of ANAITIS and NANAIA, and of the difference of their names. It is true that they were both the daughters of ZEVS or ARAMAZD; but an identity of their persons cannot be inferred from this relative circumstance. The progeny of the father of the gods is supposed to be nearly as numerous as the offspring of the late lascivious monarch of Persia, and it is highly probable that *Anaitis* or *Anaid*, and NANAIA or *Nanæa* were distinct deities. This probability is borne out by the fact of there having existed in Armenia two distinct temples, in which these two goddesses were respectively worshipped by our pagan ancestors, under distinct appellations.

* This is an extract from the historical work of AGATHANGELUS, who is the oldest Armenian historian, being Secretary to the king TIRIDATES, and having flourished in Armenia in the beginning of the fourth century. *Anahitic* is a literal translation of Անահտական, and *Nanaiatic* is exactly rendered for Նանէական, both used in the text adjectively. The derivative particle կան, attached to Անահիտ and Նանէա, is equivalent to the English particle *tic*; for example, *Asia*, *Asiatic*, *Ganges*, *Gangetic*, &c.

NOTE.—Mr. AVDALL was not aware that Dr. SWINEY had pointed out the coincidence of NANAIA with the *Nanæa* of Maccabees. This fact I added to my paper among the addenda of 1834. The name I afterwards found in HERBELOT's Bibliothèque Orientale, (folio edition,) so that the identity that I had ventured to anticipate with the *Anahid* or *Anais* of Persia, and the *Anáyasá devi* of Col. WILFORD, was then considered to be perfectly established. Mr. AVDALL's note was elicited by Mr. MASSON's conjectures as to the inscription at Bamyán, referring to the same deity. In Plate VI. of the April number, his sketch of the supposed characters is given; but I can hardly yet feel assured of their being letters.—ED.

IV.—*Notes on the Geology, &c. of the Country in the Neighbourhood of Maulamyeng* (vulg. *Moulmein*). *By Capt.* W. Foley.

[Submitted at the meeting of the 6th May.]

The town of Maulamyeng is situated on the left bank of the Martaban river, the channel by which the *Than-lweng*, *Gyeng*, and *Attayen* discharge themselves into the sea. Properly speaking, Maulamyeng may be said to mark the junction of these three rivers, as the N. E. extremity of the town approaches to within a very short distance of the confluence of the *Attayen* with the *Gyeng* and *Than-lweng*; it would also be more in accordance with usage, if in the room of "*Martaban river*," (the name by which it has been hitherto known to the British,) the designation of "*Than-lweng river*" was given to the channel above-mentioned; the *Than-lweng*, being the largest of the three rivers, is entitled to the pre-eminence of holding an uninterrupted course to the *Gulf of Martaban*.

Immediately opposite to Maulamyeng, and separated from it by the *Martaban river*, (in this place about $1\frac{1}{4}$ mile wide,) are the northern end of *Phullughewn Island* and the town of *Mowtumma*, backed by a bold and interesting chain of mountains; to the north are the *Than-lweng river* and *Joe-ka-beng* range of limestone; while on the eastern and southern sides, the town and cantonment of Maulamyeng are bounded by the *Attayen* river, and a long line of sandstone hills, a continuation of the *Mowtumma* chain, which, leaving a passage for the river, re-appears at the *Kyeit-san-lan Phyá**, and is seen taking its course to the south to the right of *Gnang-dey* and *Gneedone*.

The general aspect of the country is mountainous, the mountains taking a N. N. W. and S. S. E. direction†. The most conspicuous of these, from its superior elevation, is the *Zingyet Thowng*, situated to the N. W. of *Mowtumma*; it attains an elevation of 3000 feet above the level of the plain, and is seen at a considerable distance by vessels approaching the coast; as might have been expected, the *Gulf of Martaban*, with the country in the neighbourhood of the *Sitang* river, were visible from a pagoda placed upon a pinnacle of the mountain, and to which I had ascended on a clear day. Great labour has been expended on this quarter of the *Zingyet Thowng*, with the view of making it more attractive, and rendering the ascent less irksome, than it would naturally have been from the precipitous nature of the rock: steps have been cut into the mountain, and the several projections

* Maulamyeng pagoda.

† The direction is exceedingly variable; it is sometimes N. W. and S. E., making a corresponding difference in the inclination of the strata.

removed or sloped away. A brick wall (about 3 feet high) extends on either side of the road from the foot of the mountain to one-third of its acclivity; this is succeeded by a dry wall, composed of pieces of rock placed loosely together, and continued to the top. The pagoda is small and void of all interior ornament; three handsome bells are attached to the court-yard, one of which bears an inscription, having reference to the period of its fabrication, and the various metallic substances of which it is composed.

Adopting the nomenclature of MACCULLOCH, the rocks under review are of the *primitive* and *secondary* class; all more or less distinctly stratified, and of a highly crystalline or compact nature. The *Zingyet Thowng* is principally composed of *gneiss*, and covered with a forest more or less thick, according to the depth of the soil on which it reposes; in places where the rock approaches the surface divested of vegetable mould, little or nothing is seen save a few stunted bushes and patches of parched grass, that had been produced during the rainy season; these become more perceptible as one advances towards the summit, which, with the exception of one particular spot, the site of the pagoda, and terminating in a peak, is either round backed or cristated. The interior of the gneiss presents signs of disintegration from constant exposure to the atmosphere; indeed, the rock is in some instances so decayed that it crumbles to pieces in the hand; but for the *stratification*, it might be taken for a species of fine grained *granite:* if I mistake not, *granite* has seldom been found stratified; *gneiss* will therefore be the more appropriate name. It must, however, be observed, that the stratification of the rock is in some places indistinct and irregular, the inclination of the strata being sometimes to the northward, and not unfrequently to the southward, of west. Under this *gneiss* probably repose the quartz-rock granite and mica slate found extending from the sea (in a N. N. W. and S. S. E. direction) towards the *Kyékmi* pagoda. I regret much that it was not in my power to ascertain, by a personal and minute examination, whether such is actually the case; my visit to *Kyékmi* was unfortunately confined to a short walk upon the beach, where these rocks are found lying in the following order; they are all regularly stratified, the several strata of no great thickness, but dipping into the ground at an angle of 75° or 80°; commencing from the jetty, and advancing by the pagoda to the west, they were observed as follows:

1. *Red iron clay* (the result of decomposed sandstone?), enclosing nodules of *quartz;* this clay is *cellular*, of a ferruginous appearance, and has the property of becoming hard on exposure to the atmosphere. Q. Is this the *laterite* of the western peninsula?

2. White *quartz-rock*, alternating with

3. *Argillaceous schist;* blue or yellow, and slightly *talcose*.

4. *Quartz-rock*, white, or pale yellow, and containing a few scales of *mica*.

5. *Talcose-schist* with thin layers of *quartz*, alternating.

6. A white granite with *mica* abundantly disseminated in large yellow scales.

7. Pink, or red, *quartz-rock*.

8. A grey siliceous substance (resembling *chert)*, with veins of quartz, and succeeded by

9. *Gneiss*, similar to that of *Zingyet*, but more decomposed, from the action of the salt water,—this is probably a continuation of the Zingyet gneiss.

10. *Red iron clay;* the same as No. 1*.

The above constitute the whole of the *primitive* rocks observed in the neighbourhood of *Maulamyeng*, and with which I am at present so little familiar: the *secondary* rocks, or those now about to be noticed, are of a different character, formed under other circumstances, and at a different epoch.

The first of these, is the *sandstone* of *Mowtumma* and *Maulamyeng;* with little variation in the line of bearing, the inclination of the sandstone strata is diametrically *opposite* to that of the gneiss, quartz-rock, and mica-slate, &c. It has been already shewn, that the strata of the last mentioned rocks dip to the *westward* at a very great angle, whereas the dip of the sandstone strata is generally to the *N. E.*, and the angle of inclination not exceeding 40° or 50°. This sandstone is more frequently white, presenting spotted delineations of a pink or red colour, and is, in some instances, so highly impregnated with *silica*, that it becomes difficult to distinguish it from *quartz-rock*. The less compact portion of the rock is generally intersected by veins of quartz. In many instances, the base of the sandstone is an argillaceous cement, impregnated with oxide of iron, which gives a red colour to the rock, and renders it more liable to decomposition; large masses of this substance are found either alternating with, or resting unconformably upon, the rocks of both classes; in the latter case, transported from its parent rock (the sandstone above noticed), and assuming the appearance of a hard ferruginous breccia†.

The sandstone hills have an undulating appearance, being free from the contortions and asperities peculiar to the limestone rocks in

* See Dr. Benza's observations on the filon of hæmatitic iron in the sienitic granite of the Neilgíris, vol. IV. p. 424.—Ed.

† This rock is the same as that noticed at Kyékmi, (No. 1.)

their neighbourhood. Attaining a considerable elevation, and running parallel to each other with a distance of some miles between each chain, these mountain ranges form extensive valleys, covered with water during the S. W. monsoon, and devoted for the greater part to the cultivation of paddy; what remains untilled abounding with long grass, the coarser kind serving for house-thatch, and the less rank affording pasture for cattle during the dry season. Except in the immediate neighbourhood of the limestone, where a fine black loam prevails, and on the banks of the rivers and islands formed by the constant accumulation of mud and silt, transported from a clay-slate and limestone country, the greater part of the soil found in the plains contiguous to *Maulamyeng* is an arenaceous clay, mixed with a small portion of saline and vegetable matter*.

The only *ore* that has been hitherto found in connection with the sandstone is a "*Sulphuret of Antimony*," in a vein of quartz; it is found in the neighbourhood of *Guangdey*, and appears abundant. Leaving *Maulamyeng*, and proceeding to the north, a few limestone hummocks are seen on the right banks of the *Than-lweng* river, forming part of the long but broken chain extending to the south-east viâ *Joe-ka-beng*, *Damatha*, *Nyown-beng-zeite*, and *Kyema-row*. With an aspect so different from that of the sandstone, these limestone rocks present peculiarities of structure deserving mention; although immediately succeeding the sandstone, the S. W. chains of limestone, or those first seen in contact with it, (advancing to the N. E.,) present little or no signs of stratification. The limestone appears in detached masses, rising, as it were, perpendicularly out of the earth; and as each mass preserves a similar direction with the one preceding it, the range has, at a distance, the semblance of an extensive chain, continually broken and interrupted by some great convulsion in nature. That the sea has covered the whole of this country, and probably at no very distant period of time, is perceptible at the first view. Four distinct epochs would also seem to be marked out. The two first will include the formation of the *primitive* and *secondary* strata; the third, the *up-heaving* of these strata; and the fourth, the presence of the sea upon the whole. The shattered and divided limestone, with its mural precipices and caverns; the saline depositions so constantly met with on the plains, and other appearances of a no less conclusive character, attest the former existence and desolating

* This saline matter is in some places so abundant, that the soil is collected by salt manufacturers for lixiviation; the liquid is strained off, and subjected to the usual process of evaporation.

power of the ocean*. As has been already observed, the sandstone rock is regularly stratified: the dip being (generally) to the N. E., and its angle of inclination from 40° to 50°: on the contrary, the limestone that immediately succeeds it is (to all appearance) unstratified, or the inclination of its strata discernable only from the fissures in the rock, so great, as to merit for it the appellation of *vertical*. It may, however, be remarked, that this peculiarity of structure is perceptible only in the *Joe-ka-beng* and *Mowmah* chains of limestone; advancing to the N. E., and passing another range of the sandstone before noticed, the stratification becomes more apparent, at the same time, that the line of bearing, dip, and inclination of the strata are exactly similar to the sandstone at *Maulamyeng*.

The general structure of the limestone is *mural*, possessing considerable height but little breadth; the angles of the projecting points are sharp, and as the little vegetation produced is restricted to a few stunted trees and shrubs, the rock has a remarkably rugged appearance.

The height of *Joe-ka-beng*, the most elevated point of the S. W. chain, is probably as much as 2000 feet above the level of the plain; it has a small pagoda on its summit, which on a clear day is visible at a distance of 20 miles; but with this elevation, its greatest average breadth will not be more than 300 feet. The limestone is of a grey or lavender-blue colour, sometimes presenting spotted delineations of white, yellow, ochre yellow, and red; of a fine compact texture, rarely granulated; fracture fine and splintery; faintly translucent on the edges; and frequently intersected by veins of calc-spar, corresponding in every essential point with the English "mountain limestone," or "*secondary limestone*" of Jameson. Another characteristic of this limestone is that it is *cavernous*. The caves are of considerable magnitude, and from their containing (occasionally) inscriptions having reference to the fabrication and sculpture of the several images and temples therein placed, are interesting both to the antiquarian and the geologist. The principal caverns are those at *Yétsé*y, *Tyok-hla*, *Joe-ka-beng*, *Damatha*, *Nyown-beng-zeite*, and *Phabia*. Surrounded with jungle, these limestone caverns are not unfrequently tenanted by birds and beasts of prey. A great quantity of bat's dung is collected

* The *average* elevation of the plains above the level of the sea, at *high-water*, will not exceed six feet at the present time, while it is evident, on examination, that the banks contiguous to the sea, and subject to the influence of the tide, have been continually raised by successive depositions, and are still receiving deposits of silt or saline matter on every high rise of tide, or inundation produced by the freshes during the S. W. monsoon.

from the *Tyok-hla* cavern, and used by the natives in the manufacture of saltpetre.

Damatha Cavern, (western entrance,) situated on the left bank of the *Gyeng* river, and about 12 miles distant from *Maulamyeng*.

The mouth of this cavern is almost entirely closed by a brick wall: a small passage on the left affording entrance. It is spacious within, being about 220 feet long, 100 feet broad, and 25 feet high. The singularity attached to the cavern arises from its extending right through the hill, so that entering on the western side, one may pass out through the eastern mouth of the cave. The *stalactites* are numerous; several are of an immense size, and daily becoming larger from the continual supply of water, impregnated with calcareous matter, percolating through the hill, and giving a new crust to those already formed. *Stalagmites* likewise exist, but are generally much concealed from view by bat's dung, with which the floor of the cavern is covered. As is the case with all the larger description of caverns, that at *Damatha* is crowded with images of *Buddha* in wood and stone; he is represented in his usual sitting posture; in some instances, arrayed with the "*glories*," but more frequently without them. The workmanship is very inferior, and little attention seems to have been paid to the polishing of the stone, which is a fine crystalline marble, and naturally well adapted for sculpture. Exposed as these rude monuments of art are to the ravages of a damp atmosphere, as well as to the contamination of birds and beasts of prey, such extra labour would have been but fruitlessly bestowed; the natural white colour of the marble is either entirely defaced, or it has acquired the crystalline, reticulated appearance peculiar to the stalactite. Fronting the eastern entrance, and placed over the larger *Phyá*, is the following inscription written in the *Thalian* tongue, and specifying (as I am given to understand) the time that had elapsed since the cavern was first consecrated for the reception of the images*. The country was at that period in the hands of the *Péy-go*† government, and as marks of great age are evident throughout the whole of the works contained in the cavern, it is probable that some centuries have gone by since they were executed.

Passing out of the *Damatha* cavern on the eastern side, and following the limestone range to the south, a smaller cave may be observed within a few yards of the summit of the hill, which is in this place about 500 feet above the level of the plain; the ascent to it is extremely difficult, owing to the precipitous nature of the rock. A

* See note at the end of the paper and the inscription lithographed in Pl. X.—ED.

† Pegu.

large brick and mortar image of *Gautama* guards the entrance of the cavern, which measures 18 by 22 feet, while its average height will be as much as 20 feet. This small cave had been but lately selected by the *Phúngi*, for the better concealment of a quantity of manuscripts written in the *Thalian* or *Burmah* character, and secreted in the upper part of the *Damatha* cavern at a time that the country was invaded by the *Tshán**.

The manuscripts were placed in wooden boxes, elevated upon rafters; many had become perfectly rotten, and others were fast hastening to decay from constant exposure to damp.

It may be remarked, that curiously carved elephant's teeth were at one time to be found in these caverns, along with their less costly companions in wood and stone: these are now exceedingly scarce; the greater number have either crumbled into dust, or divested of the gilding and characteristic features of the *Buddhist* saint, have been exposed for sale in the bazar: some few have met with a better fate, and are probably now adorning the cabinets of the curious†. On a survey of the general devastation that prevails throughout these limestone caverns, it may reasonably be doubted, whether the hand of man has not proved equally destructive with time, and the elements, in obliterating much that had claim to notice by reason of superior antiquity, or novelty of design. The mutilated statues and broken shrines strewed around the caves too well attest the intrusion of other than *Barmah devotees*, and point out the havock provoked by avarice, a fanatic zeal, or the more reprehensible disregard of what is due to the feelings of a conquered people.

Notwithstanding its exceedingly compact nature, perhaps no rock possesses the property of decomposition and solubility in water to such a degree as the limestone here treated of. Hence the rich plains in its vicinity, and the no less fertile islands continually formed and nourished by the carbonaceous particles transported from a limestone country by the *Than-lweng*, *Gyeng*, and *Attayen*. This tendency to *wear* is particularly manifest at the *Phabowng Thowng*, a limestone hill on the right bank of the *Attayen*, and not far removed from the site of the late town and fort from whence that river derives its name. A cavern may be observed in this rock that has evidently been formed by a mountain torrent, which, coming from the interior, rushes through

* Siamese.

† I was fortunate enough to obtain three of these teeth: they appear to be of an immense age; the ivory of the smallest tooth is completely decayed. I have also some of the manuscripts above alluded to, and reserve the whole for presentation to the Asiatic Society. (See Proc. As. Soc. 6th May.)

it to join its waters with the *Attayen;* with an average elevation of 15 feet above the surface of the water, and a diameter of nine feet, the cavern continues to cover the stream to the distance of 80 yards or more beyond its place of junction with the river. In the dry season, the stream is comparatively tranquil; but in the S. W. monsoon, when it is greatly swelled, and becomes tremendously rapid, it rises to the summit, and by its overwhelming force and the constant attrition of its waters on the limestone rock adds considerably to the dimensions of the cave.

Beyond the *Phabowng Thowng*, and on the right bank of the *Attayen* river, are the *hot-wells*. They are three in number, and about two miles distant from the old town of *Attayen*, of which nothing now remains save a few bricks to point out the site of the wall that surrounded it. A dense jungle of reeds and long grass covers the ground, extending to the *hot-springs* and the limestone rocks in their neighbourhood. The largest of the wells is of a circular form, and apparently deep; its diameter is probably as much as 60 feet. An efflorescence of the salt it contained was perceptible on the brick wall by which it is enclosed; the taste of the salt exceedingly bitter, not unlike that of "*sulphate of magnesia**." The spring was in a state of active ebullition, and much steam arose from its surface†; on the immersion of a therm. bulb, the mercury rose to 137° Fahrenheit. The springs evidently contained much rain water collected during the S. W. monsoon, and which, overflowing the banks, is disengaged by means of small rivulets that discharge themselves into the *Attayen*. Within a short distance of the hot-springs, I noticed water that had a dark colour, and a disagreeable fœtid odour, like that of "*sulphuretted hydrogen;*" this water was cold, although contiguous to the hot-springs. Both cocoanut and palmyra trees were numerous on the spot, and did not appear to suffer from their vicinity to the hot-wells; a fine young *pipal* tree grew luxuriantly on the bank of the largest spring: on the contrary, the trees situated near the water supposed to contain "*sulphuretted hydrogen*" were of a diminutive size, and had a sickly appearance.

Advancing beyond *Mowmah*, another or second range of *sandstone* is seen to cross the *Than-lweng* river, and take a similar direction with the limestone on which it reposes; the rock is of the same compact or siliceous nature as that of *Mowtumma* and *Maulamyeng*, but covered, for the greater part, by an upper stratum of red iron clay, accom-

* A bottle of the water, taken from the hot spring, has been presented to the Asiatic Society.

† When visited by me in Dec. 1835, at an early hour in the forenoon.

panied with *steatite*, a mineral not unfrequently found associated with this clay in other parts of the coast. This range is less wooded than the sandstone to the southward, and has the ferruginous appearance peculiar to the soil.

Approaching to the village of "*Hmeebong*," one cannot but be struck with the singular appearance of the limestone rock on the right bank of the *Than-lweng:* the limestone appears, as usual, in large isolated masses; but the form assumed by some of these is remarkably grotesque, at the same time, that the stratification of the limestone is more perceptible at this place than it has hitherto been. The following may be taken as a tolerably correct representation of these rocks, as seen from the neighbourhood of *Hmeebong*. *(See fig. 2.)*

Still ascending the *Than-lweng*, and passing the island of *Colon* by either channel, the river becomes more rapid, owing to the rise of its bed and the limestone reefs that cross it for several miles to the north; the eastern channel is that generally navigated: its left bank is high and precipitous, abounding with the cellular red iron clay so plentiful at *Maulamyeng* and *Kyékmi:* from its position, the clay appears to have been transported to its present site at a comparatively recent period, and *subsequently* to a change in the course of the *Than-lweng;* for it not only reposes *horizontally* upon the limestone rocks, but is found reclining upon a thick stratum of round pebbles and coarse gravel, in every respect similar to that found in the bed of the river at the conclusion of the rainy season*. This conglomerate is perhaps best viewed at an escarpment of the bank a little beyond *Chamyah*, and the great probability of its containing organic remains merits for it the particular attention of the geologist.

The limestone rock had been hitherto observed in broken but elevated chains on either bank of the *Than-lweng*, and with the exception of the few reefs before alluded to, seldom seen to stretch across and disturb the river in its progress to the south: leaving *Colon Island* and proceeding towards the *Yengbieng Kyowng* the case is far different; the country becomes more mountainous, at the same time that the rocks appear distorted and thrown about in the utmost disorder: it seems as if a chasm had been suddenly formed in the mountains, and a passage thus opened to the *Than-lweng*. Piled upon each other in the utmost confusion, the limestone rocks not only form a wall on either side of the river, narrowing its bed, and thereby adding to the

* This *change of course* might have been *produced* by the sudden deposit of the clay; and which accumulation and deposit can only be accounted for in the same manner as reasons are assigned for the singular appearance of the limestone rocks.

rapidity of the current, but spreading themselves across, obstruct its passage, and render the navigation extremely dangerous at any other time than the N. E. moonsoon. The current of the river is very strong near *Miang* and *Mye-an*, but the principal *rapids* are met with in the neighbourhood of *Towng-bio-myo:* I accompanied Sir J. DICKSON, K. C. B., to this place in March, 1835, and we found it impossible for our boats to proceed further; indeed our return was not effected without considerable risk, owing to the force of the current, and the numerous eddies produced by the inequalities on the bed of the *Than-lweng*, which is in this place extremely deep. Accidents continually occur: a boat once drawn within the vortex of the whirlpool is inevitably lost; both boat and crew are sucked down, and never known to make their appearance on the surface.

At the mouth of the *Yengbieng Kyowng*, a spot rendered peculiarly attractive by the beauty of the surrounding scenery, the limestone is seen gradually passing into *clay-slate;* the limestone has a slaty fracture, becomes earthy, and is of a darker colour; the transition is at length so perfected (to the view) that but for the effervescence produced by the nitric acid, it becomes, in some instances, extremely difficult to detect the presence of the limestone in the argillaceous schist, with which it is intimately blended. At a short distance beyond the *Yengbien Kyowng*, a few blocks of a grey *siliceous* rock may be observed at the foot of a hill on the left bank of the *Than-lweng*;* the hill is high, of a conical shape, and covered with a thick forest and underwood. *Iron ore* is found in considerable quantities both on the hill, as well as in its vicinity; and small grains of *iron pyrites* are abundantly disseminated in the rock. This is succeeded again by the *slaty limestone*, and finally by the blue *clay-slate* that crosses the river at the *Towng-bio* rapid. Large masses of slate repose on either bank, surrounded by a micaceous sand and pebbles (consisting for the most part of *talcose slate)*, brought down from the upper country during the S. W. moonsoon. A *dyke* of *porphyritic felspar* intervenes between the slate strata; the felspar rock is of a deep yellow, and studded throughout with small circular pieces of the same mineral, of a lighter colour. I regret much that I had not leisure to pay a proper degree of attention to the structure of this rock; our party arrived on the ground late in the afternoon, and we left the place early on the following morning; but short as was my stay at the *Towng-bio* rapid, I have often since dwelled in pleasing recollection, on the wild and

* The rock is extremely hard, and slightly impregnated with carbonaceous matter.

majestic scenery so bountifully bestowed by nature on this part of the *Kayeng-dho*.

A desire to become better acquainted with the geology of this part of the world induced me to pay a visit to the *Ayein Kayeng*. The following notes, having reference to the geology of that country, are extracted from my journal, with the view of rendering the description of the rocks before mentioned more complete.

"Leaving my boat at *Mye-an*, and advancing in a N. E. direction towards the village of *Yeng-bien*, a mass of regularly stratified limestone makes its appearance on the left of the road; it forms part of a broken chain extending N. N. W. and S. S. E. The stratification of the limestone is remarkably distinct; the dip of the strata E. N. E.

"Proceeding from thence up a dry nullah, covered with fragments of slate and sandstone, the ascent lay over the blue clay-slate that is first seen reposing on the limestone at the *Towng-bio* rapid. The slate is covered with a forest of fine young male bambus, runs parallel with the limestone, and may be as much as 900-feet above the level of the plain."

"Bidding adieu to *Yeng-bien*, and advancing in the same direction towards *Mélayo*, *Tígunnéy*, *(Tshangelee,)* and *Bo-thowng*, the rocks are of the same nature as those encountered in route from *Maulamyeng* to *Towng-bio-myo*; viz. *limestone*, alternating with *sandstone* and *clay-slate*; the sandstone becomes extremely compact and siliceous in the neighbourhood of *Bo-thowng*; the limestone presents itself in the usual broken masses of various extent. But the clay-slate of *Bo-thowng* differs in colour from that of *Towng-bio*, being either pink or reddish brown, with a fine silky texture. The route from *Tígunnéy* to *Bo-thowng* is difficult and dangerous from the precipitous nature of the rock which is, at the latter place, as much as 2000 feet above the level of the plain. The ascent is also much impeded by the leaves and clay-slate pebbles profusely scattered about, and leaving little footing for the traveller on a path so inclined. Descending on the eastern side of the hill, the path (if it may be so called) lay over masses of the same pink-coloured slate, watered by a stream that precipitated itself over the rock, and rendered the descent a matter of no small difficulty; after proceeding a hundred yards or more, in that direction, the route lay to the left; a second ascent was here commenced, and passing a few heaps of stratified limestone alternating with the slate, I arrived at that part of the mountain called *Bo-thowng*: silver ore is said to exist in a limestone rock at this place, and judging from the numerous excavations that had been made by those in pursuit of the precious metal, no little labour has been used in the endeavour to discover it.

I had neither time nor opportunity for ascertaining whether silver ore *does* so exist; pieces of *copper green, iron pyrites,* and *lead ore**, deemed useless and cast aside by those in pursuit of silver, were strewed around the place, and for the first time, in this part of the world, I observed *Anthracite* dispersed in thin seams through the limestone rock. The figure of the limestone is not a little singular; emerging from the clay-slate at the upper part of the mountain, and confined to a line of 20 or 30 yards, the strata rise at a considerable angle, attaining an elevation of 90 or 100 feet, so that the exterior form of the limestone is that of a huge block, resting upon the hill, unconnected with any rock of the same class. This structure is common to the limestone throughout the whole of the *Bo-thowng* chain; but notwithstanding its peculiarity of form, the stratification is perfectly distinct; the dip of the strata being to the N. E. or E. N. E. precisely similar to that of the sandstone or clay-slate, with which it alternates."

The above notes were hastily arranged on my return from *Maulamyeng;* my residence at that place was necessarily short, and I am aware that much still remains deserving the attention of those who will possess the leisure and opportunities that I was not fortunate enough to enjoy. The field is stored with much that is valuable to the *Antiquarian,* the *Botanist,* and the lover of *Natural History.* I trust that others will, ere long, lay before the public the treasures it contains.

Note.—The inscription brought by Capt. FOLEY, from the *Damatha* cave, is certainly the most enigmatical that has yet puzzled the antiquarian. I have lithographed it in Plate X., and with the assistance of RATNA PAULA, now furnish a copy in the Roman character:

Line 1.—sakkarák lrí kun, 30—65 nhañ, sakkarák lrí kun, 4015061, nhañ, sakkarák kun lrí.

2.—50—45 nhañ, sakkarák lrí kun, 603304 nhañ, sakkarák lrí kun, 790 nhañ, sakkarák

3.—lrí kun, 370 nhañ, sakkarák lrí kun, 408—409 nhañ, sakkarák, lrí kun, 604—30 nhañ nhañ.

4.—sakkarák lrí kun, 3096-5-0 nhañ, sakkarák lrí kun, 303—50 nhañ, sakkarák lrí

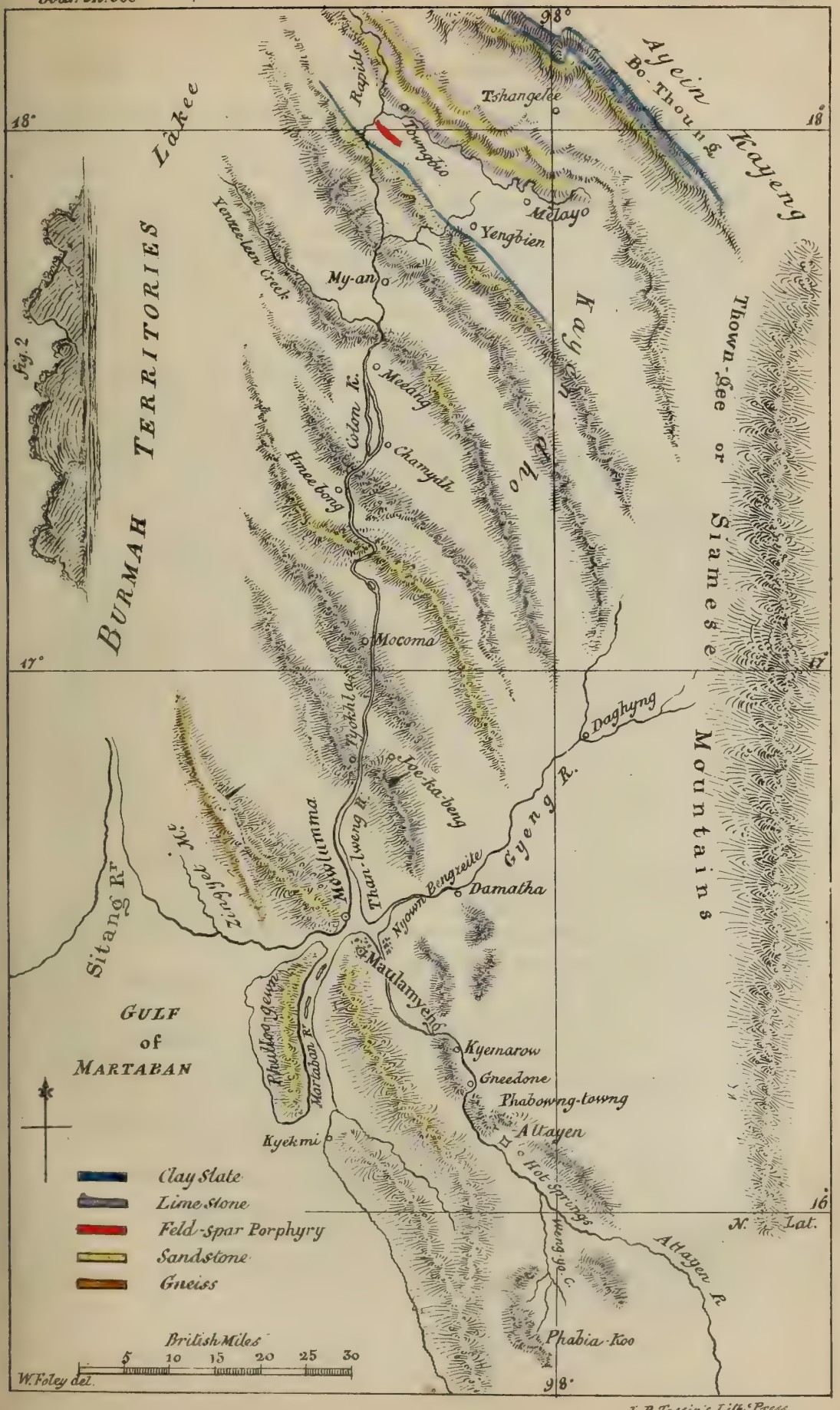
5.—kun 508309 nhañ, sakkarák lrí kun, 306060 nhañ, sakkarák lrí kun 60—303—5

6.—nhañ sakkarák lrí kun, 407—50 nhañ, sakkarák kun lrí kun, 6030304, nhañ, sakkarák lrí

7.—kun 401501 nhañ, sakkarák lrí kun, 305602 nhañ, sakkarák lrí kun, 503—704 nhañ.

All that can be predicated of this curious text is, that it contains either some profound and unintelligible calculation, or that it is a

* On analysis, it appeared to be an "*arseniate of lead.*"



W. Foley del.

J. B. Tassin's Lith. Press.

chronological register of mythological times :—if the latter, the names of the reigning monarchs are omitted as immaterial, and the simple fact announced, " in the year so and so, so many reigns ;"—but even this is conjectural, and unless errors have been committed in copying the figures, they do not run in any seeming order. The word *sakkaràk* is the Talain rendering of the Sanscrit *sakaràj*, year ; in Barmese written *sakkarèj :* the terms *lrí kun* and *nhañ* are unknown to my informant. J. P. *Sec.*

V.—*On the Revolution of the Seasons. By the Rev.* R. Everest.

In the Journal of April 1835, I gave the result of a comparison of the amount of rain-fall at Calcutta, with different positions of the moon, as far as regards her declination. The averages shew that a greater quantity of rain fell on the days when the declination was large, say from 20° to 28°, than when it was small. Now, as there are some years in the lunar cycle in which the declination never reaches to 20°, it followed, as a probable, though not a necessary, inference, that in those years there would be a deficiency of rain. Shortly afterwards I met with this note, (Humboldt's New Spain, translated by Black, vol. ii. page 86.) " Toaldo pretends to be able to deduce from a great number of observations, that the very rainy years, and consequently the great inundations, return every 19 years according to the terms of the cycle of Saros—*Rozier, Journal de Physique* 1783." The recurrence seems here spoken of as an exploded error. I have therefore used whatever means lay within my reach to obtain information as to what really has been the variation of the seasons in this country for a long time back, and I will now state the results. But I must first premise respecting the note just quoted, that great inundations are not a necessary consequence of very rainy years. Should the rain fall regularly or equably, it will be less likely to occasion an inundation, than a much less quantity falling in a very short time. This will be more particularly the case in rocky and mountainous countries, where the channels are more easily choaked. In wide-extended plains, like those of the Nile and the Ganges, the rise of the river will form a more probable criterion of the amount of the rainy-season, though not a certain one. To revert, however, to the point proposed. The year 1829, was that of the minimum declination of the moon, and from the early part of 1827, to the end of 1831, the declination is never stated in the Almanacks at above 20°. For this, or rather for a period somewhat more extended, viz. from 1826 to 1833, inclusive, we have the following facts recorded.

1826,
1827,
1828,
1829, } Great drought in N. S. Wales; Lieut. BRERETON's Travels.

1832. Public prayer by the Emperor of China for rain on account of extraordinary drought. Minimum of rain by Calcutta Register.

1833. Great drought through all the Upper Provinces, extending from Bundelkhand to Kashmir.

Let us next turn to Mr. KYD's Register of the Height of the Huglí, (see Journal, April, 1835;) and as that has been objected to as evidence, I must be allowed to say a word in its defence. It is true that the level of the Huglí at Calcutta is affected by the tides in the Bay; but according to Mr. KYD's account, such an occurrence is very rare, an inundation from the sea not happening more than once in a century. Remembering then that the ninth year before 1829 or 1820, was that of the moon's maximum declination, we find that the three or four years immediately before or after that were higher, on the average, than those farther off. Again, if we take 1811, the ninth year before 1820, and 18 years before 1829, we find that in the years nearest to it the river was lower than in those farther off. If we take the joint evidence of the height of the river, and the Calcutta register, we may assume that 1813 was the minimum year of rain; the 10th year after that or 1823, was the maximum year of rain: and in the ninth year again after that, or in 1832, came a minimum again; a period of 19 years, or a complete lunar cycle, having intervened between one minimum and its succeeding one.

With a view of ascertaining whether such a variation held in other localities, I obtained from the collector's office here, a memorandum of the character of the seasons as to rain for 21 years back. It was dictated from memory by an old native officer of the establishment, who would of course have the records of the office to refer to; and these in a climate where the crops depend so much upon the quantity of rain, would of themselves be a tolerable guide.

It begins thus: 1812, great drought; 1813, moderate; 1814 to 1823, (both inclusive, a period of 10 years,) four years very abundant, four years, abundant, two years moderate. From 1824 to 1833, (both inclusive, a period of 10 years,) one year very abundant, two years abundant, three years moderate, three years, drought; one year, 1833, great drought. The seasons of great drought are here placed 21 years apart, instead of 19, as in the former case. Evidence of this kind, like that from the height of the river, though not free from objection, can hardly be deemed unworthy of credit, when it is corroborated from other sources. There is one advantage, however, which

information of the two kinds above-mentioned, possesses over the results of a solitary rain-guage, however carefully kept, viz. that they are an index, imperfect as they may be, to what has happened over a large tract of country; whereas the rain-guage can only inform us as to one particular spot, and rain-guages in general are so much affected by peculiarities of situation, that the results afforded by any one singly, must be considered as liable to doubt. To obviate this objection, I have placed together in a table all the different series procurable, of a date posterior to 1820, (see Table No. 1.) Most of them are to be found in the different Nos. of the Journal; and the localities are between Dacca, (E. Long. 90°,) and Delhi, (E. Long. 78°,) between Nagpur, (Lat. 21°, North,) and Delhi, 28° 40′ (N.) To these are added the observations at Madras, which I have obtained through the kindness of the Astronomer there; at Macao, in China, (Journal, July, 1832,) and at Edinburgh, (see Brewster's Philosophical Journal, passim.) In Table No. 2, are given the only three series that I have for the years between 1800 and 1821. The two first (Madras and Macao) are merely the preceding parts of the series given in Table 1. The last from Carlsruhe, in Sweden, is given in the Edinburgh Philosophical Journal for 1821, there quoted from the Bibliotheque Universelle for November, 1820. The original appears to be given in French inches and lines, and I have not reduced them to English measure, as the doing so would not affect the question at issue, viz. whether some years of the lunar cycle are more rainy than others. Now to make a more correct comparison of the different years, we must first reduce the numbers given in Table 1. to a common mean. Thus, we have Dacca for eight years, (1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834,) and the mean of the different sums given is 72·80 inches; at Calcutta, for the same eight years, the mean is 60·37 inches. The difference between these, 12·43 inches, we may reasonably suppose to be owing to the localities. Subtract, therefore, from each item of the Dacca series, the mean difference 12·43; the remainders will be reduced to the mean of Calcutta*. Proceed in a similar way with the other series, only of course where the climate is drier than that of Calcutta, the mean difference must be added, and not subtracted. The series in Table No. 2, may be included in the comparison by treating them in a similar way, and then considering them only according to their position in the lunar cycle. Thus, if we take 1821 for the first year of the cycle, 1803 (or the eighteenth year before that) may also be reckoned as the first year; 1802 and 1820, will of course be the last years. Place the whole in columns numbered according to their distance from 1802 and 1820, and an average may be taken

* The more correct mode would be to multiply the Dacca series by $\frac{60{\cdot}37}{72{\cdot}80}$. —Ed.

of the whole, as in Table, No. 3. From this it appears that the average of nine years nearest the maximum is 66·34 inches, and of nine years nearest the minimum, 61·21 inches, making a difference of 5·13, or nearly $\frac{1}{11}$th of the whole between the two periods. If it be objected, that such a difference is too trivial to be decisive, we may answer that the difference shewn in the table is less than the real one. In all the series, except those of Dacca and Macao, a quantity has been added to bring them to the mean of Calcutta, and of course where two quantities differ, and a third quantity is added to each, they are brought nearer to a ratio of equality*.

Secondly, if we consider each series separately, (see Tables 1. and 2,) we shall find that each confirms the opinion of the years of maximum declination being the most rainy, except the Macao one, in which the reverse holds good. Thus the average of 1812, 1813, 1814, and 1815, (four years near the minimum,) is 80·50 inches. That of 1816, 19, 20, 21, 22, 23, 24, (seven years about the maximum,) is 61·46. Again, that of 1825, 26, 27, 28, 29, 30, 31, (seven years about the minimum,) is 71·00 inches. So that this guage, as well as the others, favours the idea of a recurrence contemporaneous with the recurrence in the lunar cycle. We may here remark, that the idea of certain localities reciprocating, or experiencing at the same time contrary variations of climate, appears, at first sight, more probable than that the quantity of precipitation over the whole globe should be abundant for a series of years, and then deficient, the great cause of evaporation, viz. the heating power of the sun, remaining all the while the same.

It will be noticed, that among the series are two from northern Europe (Edinburgh and Carlsruhe). The inference might have been drawn without them, but they were added, as being the only others of any length I had at hand, to complete the cycle. Notwithstanding the testimony of the Swedish guage, it is very doubtful whether such a variation as is there shewn is general over Europe. I say so: First. Because of the way in which the idea is treated in the note from HUMBOLDT above quoted. Secondly. From the silence of modern writers in meteorology respecting it. Thirdly. What English registers I have been able to examine (and they are for short periods, not above three or four years) do not shew a preponderance of rain towards the maximum declination of the moon, but rather the reverse; so that, from that, as well as from other sources of information, we might conjecture the variations there would rather agree with those of the Macao guage, than of the Indian ones.

In naming the places visited, either just before, or after the year 1829, by drought, the following was omitted: "During the three

* This would have been obviated by following the course mentioned in the note, page 283.—ED.

years prior to 1834, there had been a complete drought, which had brought a famine upon these islands, and, in consequence, some thousands of the inhabitants had died."—Sketches of Cape de Verd Islands.—United Service Journal, July, 1835. As these islands lie in a latitude between that of Calcutta and Madras, the fact is interesting, but I have no accounts to refer to for the state of things during that period, in the intervening countries of Egypt, Abyssinia, Arabia, and Persia.

Lastly. It will be objected, that a regularly ascending and descending series has not been made out.

This is true; but as the number of series from which to take the averages has increased, so has the tendency to it become more apparent. There is one circumstance, however, which may serve to prevent a regular ascent and descent from ever becoming perceptible, viz. the place of the perigee. Having been lately engaged in an examination of barometric heights with regard to this, I have noticed that the average amount of variation from the mean, either in excess or defect, is greater about the time of perigee, as it also is about that of maximum declination. Now there are some years in which the day of perigee coincides about the solstices with that of maximum declination, and these years are usually the extreme ones, both of moisture and drought. I subjoin a sample.

	Perigee and Max. North Decl. 1814-1815.	Perigee and Max. South Decl 1818-1819.	Perigee and Max. South Decl. 1822-1823.	Perigee and Max. South Decl. 1826-1827.	Perigee and Max. North Decl. 1831-1832.
Calcutta,			77·2	55·42	50·25
Madras,	32.27	77·08 27·62	26·61	88·67	20·07
Macao,	95·70		55·70	51·80	

The three numbers in the Calcutta guage are, one, the highest, and two the lowest up to 1833; the six numbers in the Madras guage are the four minima and two maxima noted up to the same period. Of the three numbers from the Macao guage, one only is an extreme, but the other two are very large either way. Some other circumstances, also, would lead to the belief, that peculiar localities receive the changes both of drought and moisture earlier than others. Thus the last drought was at its height in Bengal in 1832, and also at Madras; but it did not reach either Delhi or the Nilgherries to the westward until 1833. This of course introduces a new source of confusion.

There is one other way of attempting to trace the variation of the seasons, and that is by a comparison of the prices of corn in different years at different places; but this must be deferred for the present.

TABLE No. 1.

Shewing the Annual Sums of Rain in inches that have fallen in different places in different years since 1820.

	1821	1822	1823*	1824*	1825	1826*	1827	1828	1829	1830	1831	1832	1833	1834	1835
Calcutta,.....	..	..	77·20	67·30	..	55·42	64·56	57·29	59·73	63·24	58·78	50·25	60·36	68·73	85·50
Dacca,.....	..	..	..	..	..	..	74·00	46·80	80·80	93·90	89·00	66·70	62·80	68·00	..
Bancoora, ...	..	..	..	..	..	..	..	..	..	46·78	69·57	57·68	43·62	..	..
Nagpore, ...	..	..	..	..	..	65·61	53·99	46·61	50·25	33·00	65·31	37·14	..	..	..
Sagur,.....	..	..	..	..	..	..	..	31·20	46·60	32·00	64·80	..	..	..	..
Futtehpoor, ...	..	..	..	..	..	..	42·83	33·72	26·28	42·45	..	..	..	..	..
Delhi,.....	..	..	..	..	..	..	..	..	..	..	..	..	14·1	36·85	27·70
Madras, ...	47·12	58·84	26·61	33·21	55·94	60·71	88·67	37·89	37·09	34·41	40·30	20·07	36·95	40·17	37·26
Macao,.....	68·60	63·60	55·70	68·60	73·30	79·80	51·80	104·60	59·30	52·90	75·30	..	.. 9	..	..
Edinburgh,.....	..	..	..	24·64	22·42	15·27	32·59	25·23	29·86	35·20	24·83	..	..	..	..

NOTE.—In the years marked with an asterisk the Calcutta Registers are partially defective, and have been supplied from the averages.

TABLE No. 2.

Shewing the Annual sums of Rain that have fallen at different places in 20 *years previous to* 1821.

	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820
Madras, ...	..	..	66·10	31·11	31·21	61·46	54·22	..	..	..	..	..	45·65	32·27	53·55	40·07	63·72	77·08	27·62	70·09
Macao, ...	..	..	..	..	..	..	..	..	..	..	..	107·30	54·50	95·70	64·50	48·80	..	..	59·00	65·90
Carlsruhe, ..	33·80	24,00	28·00	30·10	28·70	26·60	..	26·00	25·50	26·00	21·60	21·00	25·10	19·24	19·40	31·06	26·51	21·84	..	..

Table No. 3.

Shewing the comparative quantities of Rain that fell in different places in different years of the Lunar Cycle, the years 1803 *and* 1821, *(or those next after that of Maximum Declination,) being taken as the first of the Cycle, and the whole being reduced to the mean of Calcutta.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Calcutta,	..	..	77·20	67·30	..	55.42	64·56	57·29	59·73	63·24	58·78	50·25	60·36	68·73	85·50	..	..	..
Dacca,	..	..	..	..	..	..	61·57	34·37	68·37	81·47	76·57	54·27	50·37	55·57	..	..	..	..
Bancoora,	..	..	..	..	..	..	..	..	..	50·53	73·32	61·43	47·37	..	..	..	..	..
Nagpore,	..	..	..	..	..	72.66	61·04	53·66	57·30	40·05	72·36	44·19	}					
Sagur,	..	..	..	..	..	..	..	47·31	62·71	48·11	80·91	39·86	} *	..	..	..	..	..
Futtehpore,	..	..	..	..	..	..	67·71	58·60	51·16	67·33	..	..	..	..	..	..	..	..
Delhi,	..	..	..	..	..	..	..	..	..	..	..	..	59·48	82·18	73·03	..	..	..
Edinburgh,	..	..	..	58·74	56·52	49.37	66·69	59·33	63·96	69·30	58·93	..	..	..	..	..	..	..
Madras,	83·38	48·39	48·49	78·74	71·50	..	..	..	..	..	62·93	49·95	70·83	57·35	81·00	94·36	44·90	87·37
	64·40	76·12	43·89	50·49	73·22	77.99	105·95	55·17	54·37	51·69	57·58	37·35	54·27	57·45	54·54	..	..	..
Macao,	..	..	..	..	..	..	..	..	..	101·30	48·50	89·70	58·50	42·80	..	..	53·00	59·90
	62·60	57·60	49·70	62·60	67·30	73·80	45·80	98·60	53·30	46·90	69·30	..	..	..	..	..	..	..
Carlsruhe,	66·24	68·34	66·94	64·84	..	64·24	63·74	64·24	59·84	59·24	63·34	57·44	57·64	69·24	64·74	60·04	71·04	62·24
Average,	69·15	62·61	59·24	63·78	67·13	65·58	67·13	58·73	58·97	61·68	65·68	53·83	57·35	61·90	71·76	77·20	56·31	69·84

Average of years, ... 1, 2, 3, 4, 5, 15, 16, 17, 18, ... 66 34
Average of years, ... 6, 7, 8, 9, 10, 11, 12, 13, 14, ... 61·21
Difference, ... 5·13

* The last No. of the two included within the brackets is for the year 1814 (see Journal As Soc. vol. II, 239. Climate of Nagpore).

VI.—*Recent Discovery of Fossil Bones in Perim Island, in the Cambay Gulph.*

[Read at the meeting of the 1st June.]

The following notice of the interesting discovery of this new deposit of fossil bones has been obligingly communicated to me in a letter from the Baron HUGEL, dated at Bombay the 17th April. Although its publication anticipates the arrival of the specimens themselves, it would be an injustice to science and to Dr. LUSH to delay for a moment so important an announcement. The acknowledgments of the Society are due both to the discoverer and to the Baron HUGEL, for the preference given to our museum for their preservation. I hope the circumstance may lead to fresh exertions in the valley of the *Narbada*, where doubtless much still remains to be explored.—J. P. *Sec.*

" You will receive shortly a few fossil bones from Perim Island, in the Cambay Gulph. Dr. LUSH has the merit to have found them, but without exploring them at all. I had no time to go over from Surat, where Dr. LUSH showed me them. I requested him to send them to you through Mr. WATHEN. One is an imperfect bone of a mastodon or elephant—another the head of a boar unknown, and one belonging, I think, to a '*Rongeur*;' but what induces me particularly to wish them at Calcutta is, that there is a horn in its matrix, which, connected as these fossils must necessarily be with those of the *Narbada*, might belong to that species of Bos mentioned in your Journal: it is decidedly not of a Buffalo. I was so anxious to reach Bombay, that I could not possibly go to Perim myself. I did however manage to send a boat over; and I received yesterday 41 pieces of fossil bones: the greater part belonging to the *mastodon latidens*, of which the teeth, in a perfect state, did not leave any doubt; some of the bones are of an immense size, one fractured piece of the tusk measuring from the centre to the outside of the circle $5\frac{1}{4}$ which gives $10\frac{1}{2}$ inches diameter, or 34 inches in circumference: some of them are in the same hard matrix you will see imbedding the horn; some evidently rolled by the sea. There are some curious teeth among the fragments I possess, and two triangular shaped pieces similar to the horn of a rhinoceros: the teeth are however too large to belong to that animal. I may perhaps send the most curious specimens round to you; but I am at this moment too much pleased with my discovery to part with them. It appears that the island abounds with fossils, and it is a clear proof either that the *Narbada* must have found only lately its way to the Cambay gulph, or that some other revolution must have

separated the little island from *Kattiwár*. Having no opportunity to leave this for either Persia or the Cape, I may still perhaps be able to go to Perim and Gogo, to trace the fossils on the main land of the peninsula." HUGEL.

Since the above was set in type, and just before striking off the sheet, I have been favored with the subjoined additional information from a new correspondent, Lieut. FULLJAMES, which I hasten to make known through the Journal, while I venture to assure him the thanks of the Society for his projected exertions to enrich its museum. Who will not become an enthusiast amid such discoveries? It is but four years since the existence of strata containing fossil bones was denied in India, or at least supposed to be confined to Assam and Ava. We are proud to think that the Journal has been in some measure the humble means of stimulating the search which has been thus crowned with success in so many quarters.—ED.

" On my arrival in this part of the country in the month of April, I heard a report that some bones, turned into stones, as the natives called them, had been discovered on the Island of Perim in the Gulph of Cambay, and in latitude 21° 39′.

I lost no time in going there to see if the report of fossil remains was correct, and although I do not pretend to be a geologist, or to know much about fossil osteology, still I consider my labours most amply repaid, by my first visit to the island; for I obtained a most perfect specimen of the teeth of the mastodon; one also that I think belongs to the palæotherium; and the femur, vertebræ, and many other bones belonging to mammiferous animals now extinct.

Being well aware from the perusal of your scientific Journal, how highly, and I might say justly, remains of this sort are prized, I shall take the liberty of forwarding to the Society for their acceptance a box containing specimens of these fossil remains.

The formation in which they were discovered is a tertiary conglomerate, composed of nodules of sandstone, indurated clay, and a small proportion of silex, cemented together by a yellow clay; most of the fossil remains have been exposed to view, by the sea having washed off the upper part of the matrix, but still they are firmly attached to the rock, and the only way they were to be obtained, without breaking, was by stone-cutters carefully working all round them; large quantities of petrified wood were lying about in every direction.

The following is a list of the strata as they appeared to me, commencing from the surface, viz.

1st. Loose sand and earth.

2nd. Conglomerate, composed of sandstone, clay and silex.

3rd. Yellow and whitish clay, with nodules of sandstone.

4th. Conglomerate as above.

5th. Siliceous sandstone with a few fossils. (Calcareous.—ED.)

6th. Conglomerate.

7th. Indurated clay more or less compact.

8th. Conglomerate, in which the best, and I may say nearly the whole of the fossil remains have been discovered.

The deepest strata of conglomerate are about 3 feet, but they generally do not run more than 18 inches to 2 feet, and for the most part lie horizontal. On the western side of the island, however, the strata are much disturbed, being fractured, and dipping at an acute angle to the east; on the southern end of the island, sandstone appears below the fossil stratum of conglomerate, dipping to the north at an angle of 25 degrees.

There is a tradition among the inhabitants of Gogah, that the island of Perim was formerly joined to the main land, by means of a stone bridge, which has, in the course of time, been destroyed; remains of some buildings are still to be seen, running into the sea in the shape of piers, &c. It must have been a very stupendous undertaking, for there is a channel now between the land and the island of the depth of 75 fathoms, and nearly 500 yards in width.

On the island there are the remains of a considerable fort, and buildings of Hindu architecture, for I observed in an old temple that had tumbled down, the broken figure of Buddha rudely sculptured in a sitting posture; also the remains of a large tank wall, and *bauli*. Among the other curiosities of the island are two elephants cut out in the rock; they are covered now by the sea except at very low water; one is finished, and I should say, measured about 10 feet long by 8 or 9 feet high. Capital fresh water is procurable on the island, 20 feet below the surface; it is found below the stratum of sandstone.

I will here enumerate the varieties of specimens of fossil remains, which I think have been found. Teeth of mammoth; ditto mastodon, palæotherium, hippopotamus, or rhinoceros, and a number of other smaller animals. The head of some large saurian animal; part of a tortoise; ditto of elephant's tusks. Femora, vertebræ, and other large bones; one shell in siliceous sandstone, and the half of a deer's foot. With this vast variety before me, it requires a person much better qualified than myself in the art to say to what particular animal the different specimens belong, and I therefore forward them with the hopes of hearing the opinion of the scientific in Calcutta.

It has occurred to me, on reading over the Journal for Aug. 1834, that the conglomerate in which the fossil remains in the valley of the

Nerbudda have been discovered, is very nearly similar to that in which the Perim fossil are found; and if my conjectures are correct, we shall be able to trace the formation along the whole line of the Nerbudda valley and the greater part of the Kattíwár coast. Should such be the case, and I have but little doubt in my own mind that it will be so, what a vast field has thus been thrown open, for discovery and research; I still hope to see my conjectures fulfilled with regard to finding coal in the Tajpipla or Kattíwár range of hills before the lapse of many years.

Not wishing to take the credit to myself of having been the first person to discover these remains, I should mention that I believe Dr. Lush was the first; he having, I understand, found a tusk of some animal on the island. During a second visit to the island, I was accompanied by three other gentlemen, who have most kindly given me permission to forward any part of the specimens so obtained, that I think may be acceptable.

Doubtless on further research and on breaking up the stratum, more perfect specimens of bones will be discovered: for I must mention that all those sent were covered at high water, the highest point of the island not being above 60 feet higher than high water mark; the length of the island is about $1\frac{1}{2}$ miles to 2 miles, and in breadth $\frac{1}{2}$ to $\frac{3}{4}$ mile; large sand hills are formed on the south-west side, and it is inhabited by about 12 houses of coolies, who cultivate bájrí there during the monsoon. A light-house has been established there for some years, and kept up by the Government, of which a serang and five lascars have charge: the expenses are defrayed by levying a duty on all boats passing.

Should I be able to make any further discoveries either in fossil remains, or as to the formation of the Kattíwár hill, I shall trouble you with a further communication; that is to say, should you consider the present worthy of occupying any part of the pages of your interesting Journal. Geo. Fulljames."

VII.—*Table of Sub-Himálayan Fossil Genera, in the Dádúpur Collection.* *By Lieuts.* W. E. Baker *and* H. M. Durand, *Engineers.*

The following table is intended to illustrate the proportion in which the respective genera have been found to occur, and is deduced from the specimens in our collection.

The results might have been presented in a more simple form by confining the table to the two last columns; but as information with regard to the number of perfect and imperfect specimens on which

the entries admitted into these columns are based may be deemed interesting, the following headings under which the specimens were counted off are also given.

Craniums, which title includes all specimens showing a considerable portion of the head.

Upper Jaws. Allotted to such palates as possess either one or both lines of molars complete.

Lower Jaws. Under this heading are numbered those lower jaws which are perfect, and also such as, though wanting the symphisis, present the line of molars complete. The shape of the lower jaws of the ruminantia renders them very liable to fracture immediately in front of the molars; accordingly, a great number of half jaws are found, which, being deprived of their symphisis, afford no means of accurately joining together such of them as may have belonged to the same individual. Some pairs may therefore have been overlooked; an error nearly inevitable, and which would account for the apparent excess of lower jaws in proportion to the upper.

Fragments of Upper and of Lower Jaws. Within these columns, as the heading imports, fragments of maxillaries, containing one, two, or more molars, and also those detached molars, the maxillaries of which are not in the collection, have been ranged.

As the table enters into no detail of species, the latest discoveries which it comprises may be cursorily noticed. These are a very perfect cranium and lower jaw of a species of Vulpes; an equally perfect cranium and lower jaw of a species of the genus Gulo; also an addition to the Pachyderma, consisting of the anterior half of a head, of which the posterior half was unfortunately broken off; and owing to the carelessness of the excavators, none of the fragments have hitherto been recovered. The lower jaw is locked within the upper; so that the exterior surface, and the outline of the upper molars can alone be examined; the characteristics of the teeth being thus imperfectly developed, and the occiput wanting altogether, the specimen has been inserted in the table under the general title "Cuvierian Pachyderma:" by which, however, there is no intention of conveying the idea that it has been identified with any of the Pachydermata of the Paris basin; for although it affords some analogies both to the Palæotherium and to the Anoplotherium, its essential peculiarities are sufficiently remarkable to cause it to be separated from either genus.

In the present early state of the search, the accompanying list can only be considered as an approximation to the relative numerical proportions in which the different fossil genera existed. Viewed as such, it tends to prove that species of the genera Elephas, Mastodon, Hippopotamus, Cervus, Antilope, and Bos, were abundant; that the genera

Rhinoceros, Equus, Sus, Canis, and Hyena, were of less frequent occurrence, and that the Camelidæ and the Sivatherium were rare. The habits of these genera may be adduced as reasons for modifying this general summary of the state of a former zoological period.

NOTE.—Having been favored with the perusal of the forthcoming papers on the Hippopotamus, in the Asiatic Society's Transactions, it becomes requisite to remark, that the specimen placed under the genus Anthracotherium is the same which in a note at page 59, is considered by Dr. FALCONER as belonging to a new genus, Chærotherium. In our opinion, it is a new species of Anthracotherium, under which we have accordingly numbered it. Mr. DAWE has brought to our notice a specimen in his possession, which consists of the right half of a lower jaw belonging to the *Hippopotamus Dissimilis* of Dr. FALCONER and Captain CAUTLEY. It is valuable as showing two molars which have suffered but little detrition, and which, instead of the tapering conical collines, with summits close to each other, as in the large Hippopotami, has its colline apices widely separated, the tapering taking place from the point of contact of their bases outwards: the outer side of each colline is nearly perpendicular, and from the manner in which the sloping and the upright surfaces meet, the colline top loses the mammillar aspect, assuming a flattened almost trenchant form. The wear indicated is the same as that described in the paper above alluded to.

Table of Sub-Himálayan Fossil Genera.

Class.	Order.	Genus.	Craniums.	Upper jaws.	Lower jaws.	Fragment upper jaw.	Fragments lower jaws.	Total upper jaw.	Total lower jaw.	Remarks.
Mammalia,	Feræ,	Ursus ?	0	0	1	0	0	0	1	
		Canis,.	3	0	6	2	1	5	7	
		Hyena, ...	2	0	4	9	15	11	19	
		Felis, ...	2	0	0	0	2	2	2	
		Gulo, ...	1	0	1	0	0	1	1	
	Glires,	Mus, ...	0	1	0	0	4	1	4	
		Hystrix,....	0	1	0	1	1	2	1	
	Pachyderma,	Elephas,....	9	6	22	46	31	61	53	56 doubtful mutilated fragments omitted.
		Mastodon,..	3	6	28	39	31	48	59	
		Hippopotamus, ...	11	14	20	21	43	46	63	
		Sus,.....	3	5	7	4	3	12	10	
		?	0	1	1	0	0	1	1	Cuvierian.
		?	0	0	0	2	0	2	0	
		Anthracotherium, ...	0	0	0	0	1	0	1	
		Rhinoceros,	3	3	7	18	6	24	13	
		Equus, ...	0	0	2	20	14	20	16	
		Sivatherium,	0	0	1	8	8	8	9	
	Ruminantia,	Camelus, ...	1	0	1	1	2	2	3	
		Cervus, ...	3	31	17	25	84	59	101	Many doubtful fragments not counted.
		Antilope,....	8	18	35	8	45	34	80	
		Bos, ...	2	3	12	35	25	40	37	
Reptilia,	Sauria,	Gariala, ...	0	0	0	0	0	0	0	5 fragments.
		Crocodile, ..	0	0	0	0	0	0	0	3 fragments.
	Chelonia,	Emys, ...	0	0	0	0	0	0	0	5 whole—many fragments of bothEmys and Trionix
Pisces,			3	0	0	0	0	3	0	

Dádúpur, April 27th, 1836.

VIII.—*Note on the Teeth of the Mastodon à dents etroites of the Siwálik Hills. By Captain* P. T. CAUTLEY. *Pl.* XI.

[Read at the meeting of the 1st June.]

Without further preface I refer the reader to the 1st volume of the Osemens fossiles, page 268. Figures 1 and 2, plate 4, under the head of "Divers Mastodons."

These drawings were presented to CUVIER by M. FAUJAS, and the fossil was found near Asti in Upper Italy.

CUVIER merely alludes to this fossil as one of the varieties into which the true Mastodon à dents etroites passes by a greater subdivision and an irregularity of position of the mamillæ; the proportions of length to breadth of the tooth retaining their full and perfect character.

By comparing the accompanying drawings with the figures above alluded to, there can be no demur, I imagine, in identifying the Siwálik variety of Mastodon now under review with the Asti fossil. It remains therefore simply to note the peculiarities in form of the tooth: although it may be a point of consideration hereafter, whether, as the character of the tooth is so marked, and its peculiarities so rigidly adhered to throughout the whole of the remains found in the Siwáliks, it may not be placed under a sub-genus, that of "*angustidens*," with the specific denomination of *M. Sivalensis*.

There is no cortical substance or crusta petrosa; the tooth consisting of enamel and ivory only, the former being very thick and massive, as is normal in the mastodons.

The coronal surface consists of a double line of conical and obtusely pointed mamillæ: those on the external side being in most cases perfect, whilst those on the inner side are divided by a fissure or fissures into two or three irregularly formed obtuse points. These mamillæ are not, as in the true Mastodon angustidens, placed transversely or at right angles with the line of surface, but meet each other from right to left alternately, so that the furrow on one side is interrupted by the mamilla on the other; and the mamillæ on the whole line of tooth lock into each other in the same way that two serrated edges opposed to each other might be supposed to do, were they placed in contact.

The outer surface of the enamel is smooth, and the space or furrow between each mamilla both on the external and internal surface is marked by a small tubercle, the presence of which however does not appear to be constant.

The surface of the tooth of the lower jaw wears obliquely and outwardly on the grinding surface, as in the ruminants, in which respect it differs entirely from the elephants.

The wear of the coronals is marked at the commencement by irregularly lobed figures, which, as the detrition advances, become confus-

ed, and gradually unite, until the mamillæ are worn away entirely, when the tooth is left with merely a surface of ivory surrounded by enamel.

The drawings are intended to represent the tooth at these different stages; from the state of germ, to the old and worn down tooth, shewing the intermediate state of detrition at different ages.

Pl. xi. *Fig.* 1. Fragment of tooth in germ, with the enamel on one of the mamillæ fractured.

Fig. 2. A very perfect molar of a young but adult animal, the front surface being moderately worn, and the rear portion in the state of germ. This is the right molar of the lower jaw. The length of this tooth is 9·2 inches or ·234 metres, and the breadth measured on the base or lower bulge of the mamillæ 2·95 inches or ·074 metres; it consists of six pair of points or mamillæ, with apparently (as the fossil is slightly fractured at this point) a bilobed talon in the rear. The coronal surface is here shewn.

Fig. 3. An internal view of the same tooth.

Fig. 4. An external view of the same, exhibiting the obliquity of wear on the coronal surface.

Fig. 5 and 6. Fragment of a tooth of a greater age than the preceding.

Fig. 7 and 8. Fragment of tooth with jaw attached; this is a portion of the left molar of the lower jaw of an animal of the same age as that represented in *figs.* 5 and 6, distinctly shewing the cup-like cavities formed by the detrition and gradual junction of the mamillæ: the obliquity of wear towards the outer surface is here very distinctly marked.

Fig. 9 and 10. Fragment of a tooth of the same age as the preceding.

The three last specimens have belonged to animals of nearly the same age; the mamillæ are much worn, and we see the gradual obliteration of their independent hollows, reducing the coronal surface to the appearance exhibited in *figs.* 11 and 12.

Fig. 11. Shews the detrition at an intermediate state between *figs.* 9 and 10, and *fig.* 12. The posterior portion of this specimen still retains the encircling lines of enamel on the worn down points, whilst the portion in front has arrived at its last stage of wear.

Fig. 12. May be considered as a representation of the tooth in its final state of detrition, when all marks of the mamillated form of crown is obliterated, and nothing remains but an outer border of enamel encircling a deep internal hollow of ivory.

I wish to draw attention particularly to the alternating position of the mamillæ, which I consider to be the chief specific character, and which is distinctly marked throughout the whole series; and, referring

again to the Asti fossil as figured in CUVIER, I think that a clear identification is established.

As my object in writing this note is simply to point out the distinctive characters of the teeth of the mastodon à dents etroites, which have been found in the Siwálik hills, it is unnecessary to make any further remarks until we can enter upon a general description of the fossil mastodons and elephants of these hills; noting however, that from the half of a lower jaw of this species, with its ramus attached, which is now in my possession, we may look forward to some peculiarities of form, differing very materially not only from the fossil and existing elephant, but also from the other species of mastodons.

Up to this period I am only aware of the discovery of two species of mastodons in the Siwálik hills; namely, the *variety* of *M. angustidens* which is the subject of this note, and the *M. Elephantoides* of Clift. The former is very rare, and the latter in very great abundance.

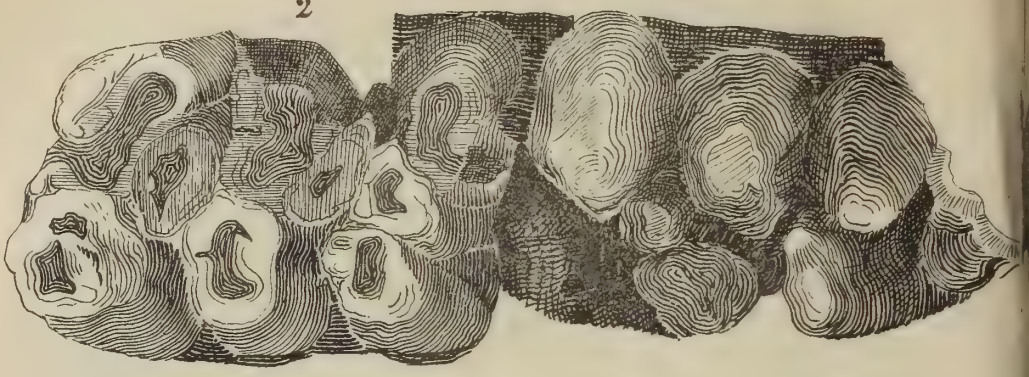
IX.—*Meteorological Register kept at Bangalore. By Dr.* J. MOUAT, *Medical Surgeon, 13th Dragoons.*

If the accompanying meteorological table, kept at Bangalore, for the year 1835, be of any interest, you are at liberty to make any use of it you please. It has been drawn up for the medical reports, which I am in the habit of transmitting to the heads of my department, and the transcription of which is all the trouble it now gives. The original table, as kept every two hours for the entire of 1834 and 1835, are also at your service; but they are two voluminous and bulky, I should think, for any useful purpose. The column of monthly average was obtained by adding the state of the thermometer, kept every two hours for the entire 24 hours; dividing this by 12, gave the average for each day. These added together for the month, and divided by the number of days in the month, give the monthly average noted in the table.

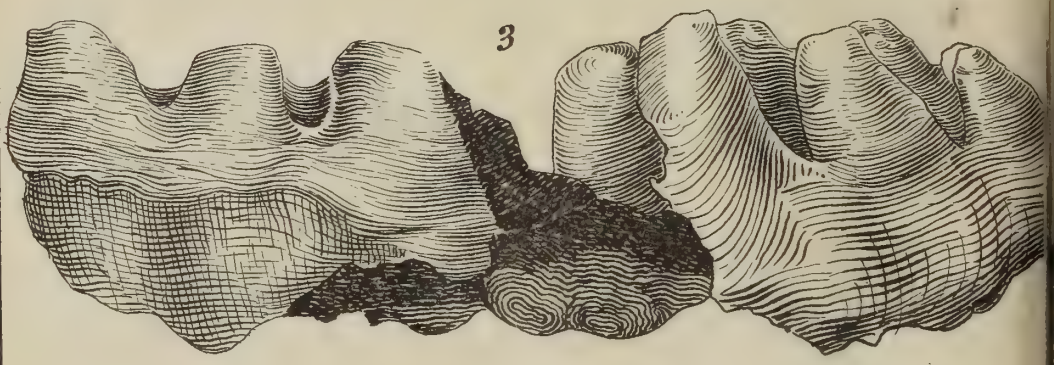
The wards of the hospital are visited by one of the medical pupils or apprentices every two hours from 10 P. M. to 4 A. M., whose duty it is to give medicine, &c. to the sick, and, at the same time, to mark the thermometer. The corporal of the guard, when relieving the sentries, is responsible, and sees this duty performed; and, in the day time, the hospital serjeant, apothecaries, pupils on duty, &c. mark it, the rest of the 24 hours; so that every source of error is endeavoured to be avoided. The thermometer marked S., or *side*, is fixed on the end of a shelf, some inches from the wall, and by its position, screened from the influence of the glare or reflected heat; the other, marked C. or *centre*, is suspended from the centre of the room, about seven feet from the floor, and the general agreement of the two instruments is a pretty good guarantee for their accuracy. The apartment is the surgery of the

Masto Mastodon Angustidens

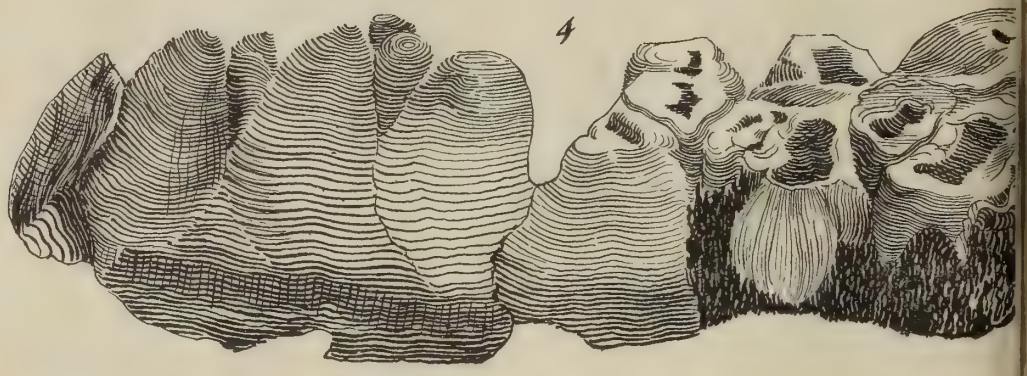
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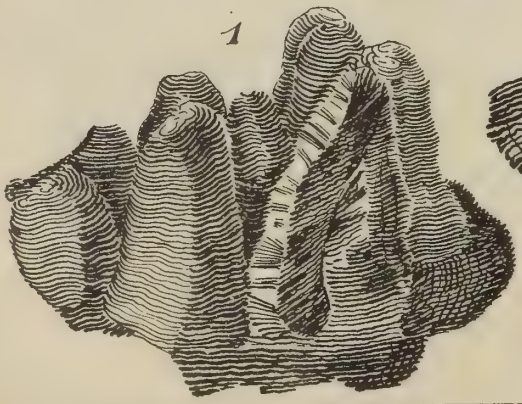
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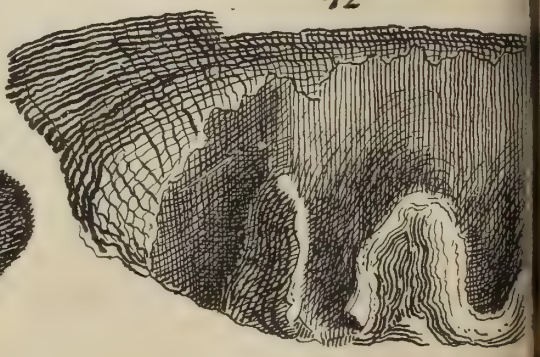
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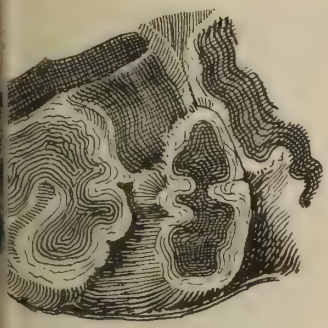


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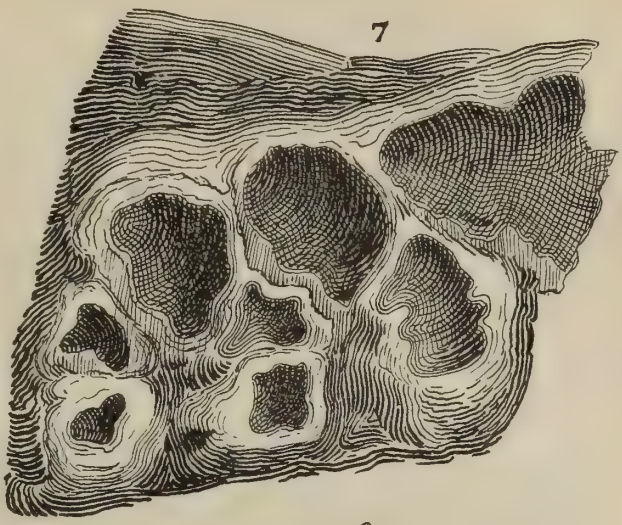


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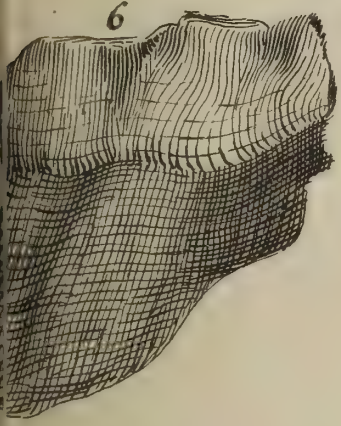
of the Siwalik hills.



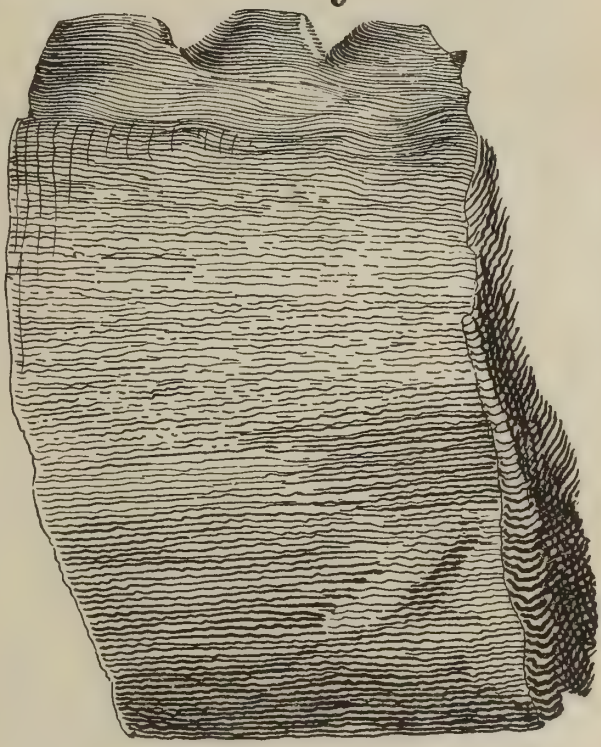
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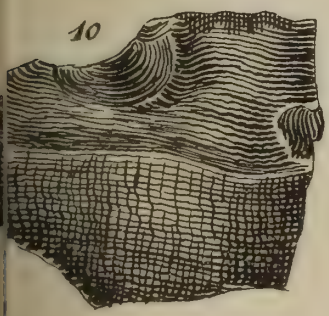
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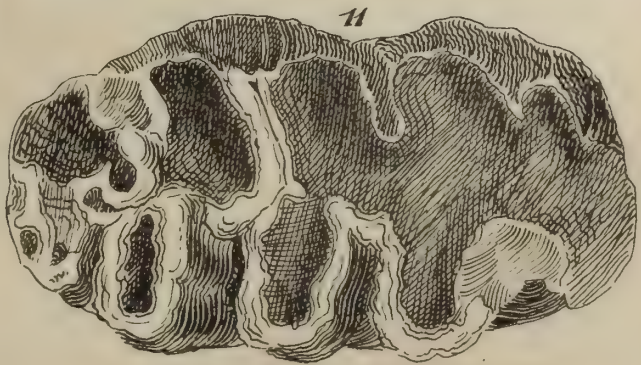
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10



11



J. B. Tassin lith.

hospital, 12 feet square, with a door facing the east and a window to the north. The former always, and the latter generally, kept open. There are also two small ventilators on the west side, always admitting a circulation of air.

The other table is from Sir. J. F. W. Herschel's suggestion of meteorological observations, &c. kept on four fixed days in each year* and the thermometer, &c. marked every hour.

Abstract of Two-hourly Meteorological Register, kept at Bangalore, 1835.

Months.	S. or Side. C. or Centre.	Monthly average of Ther., taken every 2 hours, day and night.	Average at 10 A. M., for the whole month.	Barometer. Average highest.	Barometer. Average lowest.	Barometer. Monthly Mm. Av.	Rain. Inches.	Rain. Tenths.	Wind.	Remarks.
Jan.,	S.	70.74	69.50	27.10	27.00	27.05	..	..	Eas-	Weather delightfully cool
	C.	71.58	70.25						terly.	and bracing—some foggy mornings, and after the 24th, cloudy days.
Feb.,	S.	73.53	72.50	27.75	26.98	27.36	..	..	Eas-	Weather cool and pleasant
	C.	73.07	72.00						terly.	—sun getting powerful.
Marc.,	S.	79.58	78.75	26.95	26.88	26.91	..	35	Ey. or	Mornings cool, days hot,
	C.	79.79	80.50						Sy.	and at times close and oppressive—one shower of rain.
April,	S.	78.66	78.50	26,95	26.87	26.91	4	16	Ey. or	Generally close, hot, and
	C.	78.33	78.37						S. E. th.Wy. & V.	sultry—the air cool.
May,	S.	79.22	78.50	26.85	26.79	26.82	5	89	Wy. or	Weather cool and cloudy—
	C.	79.58	78.50						S. W.	some heavy showers of rain.
June,	S.	75.66	75.25	26.79	26.81	26.80	3	24	Wy.	Weather cool and pleasant,
	C.	75.66	75.50							hazy or cloudy, with frequent showers, and some falls of rain.
July,	S.	74.45	73.75	26.75	26.78	26.76	5	88	Wy.	Weather cool and hazy,
	C.	74.64	73.00							with heavy showers, and pleasant.
Aug.,	S.	73.45	73,25	26.78	26.42	26.60	4	13	Wy.	Weather cold and chilly,
	C.	74.00	73.50							with constant showers, and some heavy falls of rain.
Sept.,	S.	74.00	73.75	26.82	26.77	26.84	13	97	Wy.th.	Weather cool, clouded, and
	C.	74.00	73.25						V. and Ey.	pleasant—several heavy showers of rain.
Oct.,	S.	70.38	70.50	26.84	26.78	26.81	5	10	Ey. &	Weather cool and pleasant,
	C.	71.71	71.50						N. E. th.Wy. & V.	with some heavy falls of rain.
Nov.,	S.	71.50	71.37	26.95	26.89	26.92	1	30	Ey. or	Weather delightful, cold,
	C.	71.78	71.50						N. E. & Wy.	bracing and generally cloudy, some foggy mornings, and at times very cold.
Dec.,	S.	69.93	69.25	26.96	26.90	26.93	..	..	N. E.	Weather cold, bracing, and
	C.	70.19	69.75						& Ey.	delightfully pleasant and invigorating.
Ann. Avg.,		74.39	73.85	26.95	62.82	26.89	44	02		

N. B. The Thermometers marked every two hours—the Barometer at 10 A. M. and 3 P. M.

* This daily register of the Barometer, at 10 A. M. and 4 P. M., would be particularly acceptable, provided the instrument was a good one, which we almost ear could not be the case. (See below.)—Ed.

X.—*Meteorological Observations, taken every hour, at Bangalore, in the Hospital of H. M. 13th Dragoons, from* 6 A. M. *of the* 21*st to* 6 P. M. *of the* 22*nd March,* 1836, *inclusive, in conformity with Sir W. Herschel's instructions. By the same.*

Hours of Observation.	Range of Barometer.	Range of 2 Therms. Side.	Range of 2 Therms. Centre.	Weather.
March, 1836.				
6 A. M. 21st,	27,01	76	76	Weather clear, cool, and pleasant.
7 ditto,....	,01	77	77	Calm; the sun getting hot when exposed outside.
8 ditto,....	,01	78	78	Much the same; sun getting very hot ditto.
9 ditto,....	,01	80	81	Ditto ditto ditto; gentle breeze.
10 ditto,....	,01	81	84	Very hot; some light clouds; ditto.
11 ditto,....	,00	82	84	Sun hot, air cool, some light clouds, wind rising.
12 Noon, ..	,01	84	84	Sun at times obscured, light clouds, and the air cool and refreshing.
1 P. M.....	,00	84	86	Ditto, ditto, ditto.
2 ditto,....	,00	84	88	Ditto, ditto, ditto.
3 ditto,....	,00	85	86	Sun very oppressive, very little wind, and very hot and close; some light clouds.
4 ditto,....	26,95	85	88	Very close; the sun very hot, scarcely any wind.
5 ditto,....	,95	84	86	Getting cool, wind rising, and very pleasant.
6 ditto,....	,95	84	86	Calm and pleasant; sky clear.
7 ditto,....	,95	84	86	Ditto and very close; light clouds; some lightning; S. E.
8 ditto,....	,95	83	84	Ditto gentle breeze ditto ditto.
9 ditto,....	,95	82	84	Gentle breeze; some heavy clouds; Wy. ditto.
10 ditto,....	,96	81	83	Calm and very sultry; some heavy clouds hovering about; some lightning; S. E.
11 ditto,....	,97	81	82	Slight breeze from S. E.; sky clearer, some lightning, N. W.
12 Midnight,	,97	80	79	Ditto, clear sky; frequent; ditto ditto.
1 A. M. 22d,	,98	80	78	Cool and pleasant; ditto; gentle breeze from S. E.
2 ditto,....	,98	80	78	Wind rising and strong from S. E.; at times variable; sky clear.
3 ditto,....	,98	80	79	Still strong breeze from S. E.; at times Wy. do. do.
4 ditto,....	,98	78	77	Gentle cool breezes ditto; cloudless sky.
5 ditto,....	27,00	80	78	Ditto ditto.
6 ditto,....	,00	78	78	Very gentle breeze; not so cool as at 5, but pleasant; ditto.
7 ditto,....	26,98	77	77	Clear and pretty cool; very calm, but the sun getting hot.
8 ditto,....	27,00	79	79	Ditto ditto, ditto ditto.
9 ditto,....	,00	80	81	Much the same, but the sun getting very hot, scarcely any breeze.
10 ditto,....	,00	81	83	Getting very hot, very calm and clear, slight breeze.
11 ditto,....	,00	82	85	Gentle breeze from N.; sky clear, sun hot, but not oppressive.
12 Noon. ..	,00	83	86	Calm and sultry; light clouds; sun getting very hot.
1 P. M.....	,00	83	86	Sky clear and cloudless; slight breeze from N.; sun very hot.
2 ditto,....	,00	84	87	Ditto ditto, hot and sultry.
3 ditto,....	26,98	85	86	Ditto ditto, ditto ditto.
4 ditto,....	,95	85	87	Very sultry; little or no wind; sky clear.
5 ditto,.. .	,93	85	87	Ditto ditto ditto.
6 ditto,....	,93	84	87	Ditto ditto ditto.
Hourly Mean Average, ..	26,98	81.59	82.73	

N. B. The observations were made in an apartment 12 feet square. One thermometer hung in the centre, 7 feet from the floor; the other, at the end of a shelf, some inches from the wall, and quite protected from reflected heat.—The room has a door facing the east, and a small window to the north, both left open*.

* The march of the Barometer seems so sluggish that we fear the observer neglected to tap the tube previous to reading off—an indispensable precaution with ordinary instruments.—ED.

XI.—*Horary Observations taken at Dádúpur, in conformity with Sir John Herschel's Circular. By Col.* Colvin, *Lieut.* Baker, *and Lieut.* Durand, *Engineers.*

[The original, whence we have with permission extracted these tables for publication, has been forwarded to the Secy. of the South African Phil. Inst.]

Barometrical Observations taken at Dádúpur, Sept. 1835.

Days.	Time.	Wet Bulb.	Detached Thermometer.	Barometer, by Cary. Attached Thermt.	Barometer, by Cary. Barometer.	Mountain Barom. by Troughton. Attached Thermt.	Mountain Barom. by Troughton. Barometer.	Remarks.
	H	D.	D.	D.	Inch.	D.	Inch.	
		°	°	°		°		
20	18	73·	72·8	73·2	28·690	73·6	23·924	Calm. Mist cannot be seen through for 300 yards, appears less over head.
,,	19	74·9	74·8	75·	695	75·	932	Ditto ditto clearing off a little, with just a breath of wind from east.
,,	20	75·4	75·7	75·8	706	75·6	942	Ditto ditto ditto objects becoming visible 800 to 1000 yards off, air just perceptible E.
,,	21	77·2	78·	78·4	727	78·	960	Wind S. W. light and variable, clear except light wreaths of mist along the horizon.
,,	22	80·9	81·8	81·9	744	81·3	983	,, ditto very light ditto, with light low transparent clouds, apparently the remains of the mist.
,,	23	81·6	83·5	84·6	740	84·4	981	,, W. light ditto, still a few light clouds.
,,	24	81·6	84·6	85·3	728	84·2	963	,, W. light and variable, ditto ditto ditto.
21	1	82·	85·8	86·3	704	85·7	934	,, W. light breeze, ditto ditto ditto.
,,	2	81·6	87·5	87·7	665	86·9	904	,, W. ditto ditto ditto, except the line of mountains which is clouded.
,,	3	80·4	87·2	87·7	636	87·2	872	,, W. by N. ditto ditto ditto ditto ditto, N. to S. E. in white masses.
,,	4	79·4	86·8	87·2	609	86·7	845	,, N. W. ditto ditto ditto ditto ditto N. E. to S. E. ditto.
,,	5	79·7	85·1	86·2	610	85·4	834	,, Ditto ditto ditto ditto ditto ditto.
,,	6	77·6	82·2	83·	711	82·4	810	,, Ditto much fallen, ditto light clouds over the mountains and on the S. W. horizon.
,,	7	77·	80·	80·8	626	80·2	823	,, Ditto as before, ditto ditto ditto ditto.
,,	8	75·2	78·2	79·	604	79·	829	,, Ditto ditto ditto, stars bright.
,,	9	75·5	77·7	78·5	605	78·2	849	,, Ditto light ditto ditto.
,,	10	75·	76·4	77·7	612	78·7	860	,, Ditto breeze in gusts, ditto ditto.
,,	11	73·3	75·	75·7	620	76·2	870	,, Ditto ditto light ditto ditto.
,,	12	73·2	74·2	75·	618	75·3	842	Light air westerly ditto ditto.
,,	13	72·	73·	73·5	609	74·2	832	Ditto ditto ditto ditto.
,,	14	70·7	71·7	72·5	615	73·	846	Ditto ditto ditto ditto.
,,	15	70·5	71·2	71·8	607	72·2	827	Ditto ditto ditto ditto.
,,	16	70·	70·8	71·2	607	71.5	829	Ditto ditto ditto ditto.
,,	17	70·	70·3	71·	622	71·2	840	Ditto ditto ditto do dawn appearing.
,,	18	69·3	69·7	70·4	620	70·6	848	,, Calm, ditto mountains cloudless.
,,	19	71·4	71·6	72·	637	72·	869	,, Ditto ditto ditto.
,,	20	75·2	76·5	76·5	663	75·8	890	,, Ditto ditto, except light clouds over the mountains.
,,	21	78·	80·	80·	678	79·2	907	,, Ditto ditto ditto ditto N E. to S. E.
,,	22	79·6	82·	82·3	690	81·5	916	A very light air from E. ditto large white clouds on and behind the mountain range.
,,	23	80·2	83·5	83·9	683	83·4	918	,, Ditto ,, W. ditto ditto ditto ditto.
,,	24	80·4	85·2	85·5	674	84·5	903	,, Ditto ,, W. ditto masses of ditto ditto ditto N. by E. to S. E.
22	1	81·	87·	87·1	647	86·5	872	,, N. W. light breeze, ditto ditto ditto.
,,	2	80·8	87·3	87·8	605	87·5	839	,, Ditto ditto ditto ditto ditto ditto.
,,	3	81·2	88·1	88·5	584	87·7	823	,, Ditto in gusts ditto ditto ditto ditto.
,,	4	80·8	87·8	88·4	573	87·7	795	,, ditto ditto ditto ditto ditto ditto ditto.
,,	5	79·8	86·	87·	572	86·3	790	,, W. ditto ditto ditto, mountains clear to N. cloudy to E. and S. E.
,,	6	79·	82·6	84·2	568	83·5	786	,, W. light ditto ditto ditto ditto.

Observation commenced at 6·0·30· A. M. of 21st September, common reckoning.

Barometrical Observations taken at Dádúpur, March, 1836.

Day.	Time.	Wet. Bulb.	Detached Thermometer.	Barometer, by Cary.		Mountain Bar. by Troughton.		Remarks.
				Attached Therm.	Barom.	Attached Therm.	Barom.	
	H	D.	D.	D.	Inch.	D.	Inch.	
		°	°					
20	22	65·3	71·	70·6	28·988	70·	29·128	Wind E.
,,	23	67·	71·5	73·2	982	72·3	116	Wind E. sky clear, over head light clouds to South, Sirmur mountains clouded.
,,	24	69·	75·	75·5	970	75·	105	Wind E. light clouds over mountains excepting the sub-Himálayas, which are visible.
21	1	70·7	77·5	78·	954	77·3	080	Ditto ditto ditto ditto.
,,	2	70·2	77·5	78·5	923	78·	053	Wind S. E. light but steady clouds in direction of mountains cover more of the sky.
,,	3	67·0	75·	75·3	912	74·6	023	Wind E. Gusty, clear over head, light clouds all round the horizon.
,,	4	66·2	74·5	75·2	913	74·5	038	Wind N. by E. unsteady, clear over head, cloudy from N. W. to N. E. outline of mountains visible.
,,	5	64·	71·2	72·	907	71·2	026	Wind N. by E. unsteady, clear to S. W. Elsewhere clouded, stormy appearance to north.
,,	6	64·8	71·	71·5	902	70·6	020	Wind N. light. Clear to S. W. Elsewhere light clouds, outline of hills visible.
,,	7	62·2	66·	67·2	897	66·4	014	Ditto ditto ditto ditto ditto.
,,	8	60·4	63·	64·1	892	64·1	010	Ditto ditto ditto ditto ditto.
,,	9	59·	60·5	62·	900	61·5	027	Wind S. E. night clear.
,,	10	58·5	60·	61·	898	61·	030	Ditto very light, night clear.
,,	11	57·	58·5	59·5	894	59·5	018	Clear. Clear star light.
,,	12	56·2	57·	58·5	884	59·	011	Ditto ditto.
,,	13	54·5	55·7	57.	881	56·5	000	Wind N. very light, clear star light.
,,	14	53·5	54·5	55·5	860	55·	28·996	Ditto ditto ditto.
,,	15	53·	53·8	54·5	856	55·5	984	Ditto ditto ditto.
,,	16	52·5	52·5	55·	854	53·2	982	Ditto ditto ditto.
,,	17	51·	51·3	52·3	855	52·	984	Wind N. brisk, clear star light. Dawn commencing.
,,	18	49·3	49·5	51·7	863	51·	29·003	Wind N. light, sky clear.
,,	19	49·5	50·	51·	881	50·2	021	N. by E. ditto ditto.
,,	20	58·2	55·5	55·7	915	54·7	059	Ditto ditto ditto.
,,	21	59·	63·	62·7	948	61·4	097	Ditto ditto ditto.
,,	22	62·2	68·	67·7	964	66·7	116	Ditto ditto ditto.
,,	23	64·7	70·7	71·	971	70·	111	Calm, sky clear.
,,	24	66·5	73·5	74·	954	73·2	091	Wind S. E. light, sky clear.
22	1	68·8	76·1	76·5	944	75·7	077	Ditto ditto ditto.
,,	2	68·5	76·6	76·8	923	76·1	036	Calm, sky clear.
,,	3	69·7	78·	78·5	900	77·9	023	Wind S. W. light, sky clear, except light clouds over the mountains.
,,	4	69·7	78·	78·5	868	78·	000	Wind W. light ditto ditto ditto.
,,	5	69·5	77·7	78·3	864	77·5	28·994	Ditto ditto ditto ditto.
,,	6	70·	76·	76·7	867	76·	991	Ditto ditto ditto ditto.

Time ascertained by one observation of equal altitudes. Observation commenced at 10h. 21m. 31s. of 21st March, common reckoning, and was continued at exact intervals of one hour. (For convenience the minutes and seconds have been omitted in the table.—ED.)

Memoranda relative to the above Table of Barometrical observations for September 1835. *By Lieut.* DURAND.

Instruments employed.—Colonel COLVIN's Barometer was made by CARY. The cistern is of ivory, the Instrument is adjusted for observation by bringing the surface of the mercury to a level with the slit in the socket of the stopcock of the cistern, by means of a brass screw at the bottom of the cistern. This instrument was, when compared with the standard Barometer in Calcutta, by J. PRINSEP, Esq., found to be correct.

Lieut. DURAND's Barometer is one of TROUGHTON and SIMM's mountain Barometers. When compared with the standard Barometer, it stood 0.043 too low.

In order to determine the amount of change which the two instruments might have suffered, relatively to each other, in consequence of the journey from Calcutta, a comparison was instituted between the heights shown by the two Barometers, during the month of June 1835; the following is the result.

Mean. Height of Bar.	Attd. Ther.	Detd. Ther.	Moist Bulb.	Time.	Mean of the foregoing.				
28.744	90.4	89.51	83.15	10 A. M	28·6944	92.92	91.83	84.145	CARY'S Barometer.
28.6488	95.44	94.25	85.14	4 P. M.					
28.7486	87.83	86.51	83.22	10 A. M.	28.7035	88.616	87.236	83.	TROUGHTON and SIMM'S Barometer.
28.6585	89.4	87.96	82.79	4 P. M.					

Whence may be deduced, that CARY's barometer suffered considerable derangement from the inevitable jolting, &c. attendant on so long a journey. TROUGHTON's had evidently been less disordered, probably but little so; without a second comparison with the standard barometer, however, the comparative accuracy of TROUGHTON's rests upon supposition.

Previous to the day on which the hourly observations were to commence, CARY's Barometer was accidentally put out of order, and it became requisite to re-fill the tube with mercury; this was accordingly effected, but the means for safely heating the filled tube not being at hand, and the tube appearing to the eye free from air, it was inserted into the instrument; the observations show the great difference which this untimely accident caused in the heights of the two mercurial columns.

Thermometers.—The attached thermometers of both barometers read off to degrees.

The thermometer employed as a moist bulb, is one made by TROUGHTON and SIMMS. When compared in Calcutta it stood 1·3 too high; the scale is graduated to degrees.

The detached thermometer also by TROUGHTON and SIMMS, reads off only to two degree divisions; when examined in Calcutta it was found to be 0·4 too high.

From the foregoing remarks on the thermometers, it is evident that the division of the scales of these instruments did not admit any perfect accuracy in reading off the decimal parts of a degree: the decimal parts in the table are therefore only careful approximations, and under particular circumstances, such as reading off at night, &c. small inaccuracies must have been unavoidable.

Time.—The time of apparent noon and the rate of chronometer were ascertained by a series of observations of equal altitudes of the sun, on the 17th, 18th, 19th and 20th September.

Location of Instruments.—The instruments were placed in a verandah facing the north, perfectly shaded, and sheltered from the wind, without, at the same time, hindering a free circulation of air. CARY's Barometer stood about 4*ft.* 6, from the wall; TROUGHTON's about 1*ft.* 6, from the wall, the space partitioned off and allotted to the instruments not admitting their further removal from the northern front of the building.

Place of Observation.—Dádúpur is situated on the right bank of the Jamna, a little below the junction of the Sombe: the position of the Canal

Department depot is somewhat north of the village, and is in latitude 30° 12 N. and about longitude 77° 23′ 45″ E. as deduced from an observation of the transit of mercury on the 5th May, 1832. The range of low mountains separated from the more lofty and older formations by the Kyadur Doon is about 20 miles from Dádúpur. The word mountains which enters amongst the remarks on the particulars of the weather, must be understood to allude to the distant ranges of the Himálayas, and not to the low and neighbouring mountains.

It is necessary to add,that the hourly observations were taken by Colonel COLVIN, Engrs., Lieut. BAKER, Engrs., and Lieut. DURAND, Engrs.

Dádúpur, Nov. 24th, 1835.

The same remarks are applicable to the March observations, CARY's Barometer not having been yet boiled ; the site of the instruments was changed, being now under a thatch erected for them in a free circulation of air.

XII.—*Proceedings of the Asiatic Society.*

Wednesday evening, the 1st June, 1836.

W. H. MACNAGHTEN, Esq. Vice-President, in the chair.

Messrs. W. BRUCE and R. W. G. FRITH, proposed at the last meeting, were ballotted for, and elected members of the Society.

Dr. LUMQUA, proposed at the last meeting, was, upon the recommendation of the Committee of Papers, elected an honorary member.

The Rev. R. EVEREST, requested his name to be withdrawn from the list of members.

Captain W. FOLEY regretted, that private circumstances obliged him also to retire from the Society.

Read letters from Colonel J. COLVIN, Engineers, Colonel CAULFIELD, and Colonel STACY, acknowledging their election as members of the Society.

Read letters from NICHOLAS CARLISLE, Esq. Secretary to the Antiquarian Society of London, and J. FORSHALL, Esq. Secretary to the British Museum, acknowledging the receipt of copies of the Index, &c.

Read a letter from Captain H. HARKNESS, Secretary to the Oriental Translation Committee of the Royal Asiatic Society, stating, that arrears of the Society's subscription were due, to the amount of £31 10*s.* from 1833 to 1835, inclusive.

Ordered, that the arrears be paid up, with an apology for the delay.

The Secretary stated, that upon an application from himself on the part of the Society, the Government had been pleased to grant exemption from postage on all certified "*proof sheets,*" addressed by him to authors or editors for correction, as well as on their return, similarly attested to his address. The Government was also willing to grant exemption from duty on objects of Natural History or Curiosity, imported for or exported from the museum ; application to be made in each particular case.

Library.

Read a letter from Captain R. B. PEMBERTON, forwarding a copy of his report on the eastern frontier of British India, with an appendix and maps, for presentation to the Society.

Also, from Dr. MCCLELLAND, a copy of his work entitled " Inquiries in Kemaon," Statistical and Geological.

Read a letter from JAMES R. EWART, Esq. forwarding on behalf of Captain J. JERVIS, a copy of his publication on Indian Meteorology.

Die Philosophie der Hindu Vaedanta Sara von Sadananda des Ram Krishna Tirtha von Dr. OTHMAR FRANK—*presented by the author.*

Ueber das Bild des Welthaumeisters, Visvakarma, von OTHMAR FRANK —*presented by the author.*

The Indian Journal of Medical Science, No. 61, June 1836—*by Dr. Corbyn the Editor.*

The following books were received from the booksellers:

LARDNER's Cabinet Cyclopedia, SWAINSON's quadrupeds.
————————————, Greece, Vol. 2nd.
————————————, Rome, Vol. 2nd.

Illustrations of the Botany and other branches of the Natural History of the Himálaya mountains, by J. F. ROYLE, Esq. F. L. S. and G. S. and M. A. S., parts 7th and 8th.

Museum.

Four gold and silver fish, from Nipál, were presented by HARI' DA's, Mahant of Patna.

A drawing, supposed to be of the Allahabad láth; as it stood when perfect, was received with a note from Dr. MOUAT, H. M. 13th Dragoons at Bangalore.

This drawing accords more exactly with the láth in Tirhut, for which it was doubtless intended, (See Vol. IV. page 122.)

Literary.

A paper on the valley of Cashmir, by the Baron HUGEL, was read.

The author's detention at Bombay has enabled him to communicate at greater length the observations made during his recent visit to the valley. The Society is much beholden to this illustrious traveller for thus disinterestedly placing at its disposal the results of his personal labours, notwithstanding he has doubtless the intention of publishing himself on his return to his own country.

The latitude of *Kashmir* town (*Srínagar*) is 34° 22′ 58″ and (if Vizirabad is correctly laid down in ELPHINSTONE's map), its longitade is 75° 12′ 30″ by cross-bearings taken by the Baron from the latter place to the *Pirpanjabl* pass, the bearing of which was also taken at *Kashmir* town.

In most maps the situation of this place is 34° 40′ lat. and 75° 58′ long:—in HAMILTON 33° 23′ lat. 74° 47′ long.: and in H. T. PRINSEP's RANJEET SINGH, derived from Capt. MURRAY's information, 34° 9′ and 75° 32′ respectively*.

A paper by Mr. AVDALL, entitled "A Memoir of a Hindu colony in ancient Armenia," was submitted.

[This will be printed in our next.]

An attempt to fix the epochs of the four principal Buddhas, by Captain FORBES, of Ceylon, was presented.

Mr. CSOMA's translation of the Bhotian Banner Inscription, presented at the meeting of March, was read.

[Printed in the present number.]

Facsimile of inscription on the Bhittree láth near Gházipur, was presented by Lieut. A. CUNNINGHAM, together with a drawing of the pillar.

A memoir on the geography of Peucelaotis, and elucidations of ALEXANDER's march, together with drawings of all the coins and relics discovered by himself, and a map of the country from his own surveys, intended for presentation to M. JACQUET of the Paris Asiatic Society, was obligingly entrusted by the author M. COURT, of Mahárája RANJIT SINH's service, to the Secretary, for free communication to the Society of such information as they may think worthy of extraction.

Physical.

Extract of a letter from the Baron HUGEL to the Society, was read, announcing the important discovery of a bed of fossil bones in Perim island, in the gulph of Cambay.

[Printed in the present number.]

* In the note on Kashmir published in the March No. p. 185, we asserted the latitude to be 34° 35′ with meridional (double) altitude, 72° 4′.—We supposed the latter corrected to the Sun's centre; as that was not the case, 15′ must be deducted, while 3′ must be added for difference of declination from Greenwich—making the latitude as above, 34° 23′.—ED.

Specimens of lignite and fossil wood from Nipál, were presented on the part of Subadar JODA SINGH.

Specimens of quartz fossil wood and shells from Van Dieman's Land, presented by C. K. ROBISON, Esq.

A note on the teeth of the *Mastodon angustidens* of the Siwálik hills, was received by Captain CAUTLEY.

Also, by Dr. FALCONER and Capt. CAUTLEY, a memoir on the *Felis Cristata*, a new fossil tiger from the Siwalik hills.

A skeleton of a tortoise (CAREY's *Kuchuya*), presented by Mr. J. T. PEARSON.

Specimens of the Indian Barbet, (*Bucco Indicus,*) Woodpecker, (*Picus Macei,*) and smaller green pigeon, (*Vinago Vernans,*) presented by Lieut. C. MONTRIOU, Ind. Navy.

A specimen of the wandering Albatros, (*Diomedea exulans,*) presented by J. CHILD, Esq.

A specimen of the Bald Ibis, (*Ibis calva,*) presented by Dr. A. CAMPBELL.

Skulls of the tiger, (*Felis Tigris,*) Leopard, (*F. Leopardus,*) long-lipped bear, (*Ursus labiatus,*) and Gurriyal, (*Garialis Gangeticus,*) presented by Dr. McCOSH.

A specimen of the ornamented snake, (*Coluber Ornata,*) presented by Mr. KYD.

A specimen of *Gecko vittatus* (var.) by Dr. A. JACKSON.

XIII.—*Address read before the Bombay Branch of the Royal Asiatic Society, on the 27th January,* 1836. *By the Rev.* JOHN WILSON, *President.*

[This address, obligingly communicated to us by the author, gives so valuable a review of all that has been done by the Bombay Society, that we make no apology, but rather feel a pride in transferring it to our pages entire: the rather because Bombay does not yet boast a Journal of its own, like Madras does. Since the establishment of the latter journal, we have discontinued inserting the Proceedings of the Society at that Presidency, conceiving the means for their preservation and circulation to be more appropriately provided for.—ED.]

This Society has now been in existence for upwards of thirty years; and it may not be improper for us, in our present circumstances, briefly to advert to its past proceedings, and to some of the various subjects of inquiry, and especially those connected with our situation in western India, which still invite our attention.

In the discourse delivered at the formation of the institution, by its first President Sir JAMES MACKINTOSH, that great man declared himself "ambitious of no higher office than that of conveying to India the desires and wants of the learned at home." A more worthy "representative of the curiosity of Europe," could not have presented himself in this country. It must be admitted, however, that, powerful as was his influence, and remarkable as has been the zeal and success of the members in prosecuting some of the objects proper for investigation by an Asiatic Society, their contributions on the topics to which he more particularly directed attention, have not been so numerous and extensive as might have been reasonably expected.

On Natural History, on which he dwells at greatest length, there are in our Transactions only a few distinct contributions, while the subject is only partially adverted to in the papers descriptive of particular districts of the country. This is undoubtedly a matter of regret, for the

study, directly conversant as it is with the works of God, and with the intimations which they give of His wisdom, power, and goodness, is, in all circumstances, possessed of the highest interest, and conduces both to intellectual gratification and to moral improvement; and in such a country as India, so vast in its extent, and so grand and multifarious in its productions, it is possessed of peculiar charms. It is a study, in many of its branches, so intimately connected with national resources, and the useful arts, and the means of humane amelioration, that it is powerfully recommended to every economist and philanthropist. It is a study in which most who have received a liberal education may engage, and to advance which, all who give it an ordinary share of attention, may considerably contribute. The sojourners in Bombay have, in the mountains, forests, and islands, in the neighbourhood, innumerable objects, connected especially with Geology, Botany, and Zoology, which both from their comparative novelty, and intrinsic interest invite attention. The Society cannot do better than encourage their investigation, and imitate in reference to them, the laudable procedure of the sister institution in Bengal, with regard to those of a similar nature more particularly connected with that province, and among whose highest honours must ever be, its having numbered among its members such men as Roxburgh and Wallich, and fostered their earliest attempts to unfold the beauties and mysteries of creation. The report of observation and discovery connected with them, if given in this place, would form an agreeable entertainment even to those who may be most ardent and persevering in their researches into the other important objects of the Society's investigation. That a studious attention to both of them, by individuals, is not impracticable, is well evinced in the cases of Jones, and Colebrooke, and Carey, and others, who have been distinguished in India both for their science and literature; and who have been not less remarkable for their knowledge and expositions of the thought and feeling of man, as connected with the objects of his devout regard, or superstitious reverence, and the language by which he holds communion with his fellows, than for their lively cognizance, and philosophic interpretation, of the varied phenomena of nature.

The Statistics of any country are intimately connected with its Political Economy, and are consequently highly worthy of attention. Their importance was not so generally admitted, as at present, on the formation of our Society; but it is strikingly set forth by Sir James Mackintosh. The tables which he himself presented, connected with the population of Bombay, and the remarks with which he accompanied them, are valuable. Similar ones, of a later date, are desiderata, and when compared with those given by him, would furnish curious information. The Notices of Jambusar and Loni, given in our Transactions, by Drs. Marshall and Coates; and of certain districts of the southern Maratha Country, and of the *Jharejas*, of *Kach*, in the Journal of the home Society, by Dr. Bird, and Lieutenant Burnes, are good specimens of what is required of other localities and tribes. Without the assistance of our liberal Government, little can be done with satisfaction in this department. Such assistance, by instituting special inquiries, and by delivering up documents already in its possession, or which could be procured by application to its judges, and magistrates, and revenue officers, it could easily, and with great advantage to itself, render*.

Only one paper on the subject of Political Economy, as connected with

* A proposition has, I understand, been made, by an able and zealous officer of this Presidency (Capt. T. B. Jervis) to the different Governments of India, relative to the periodical publication of the returns of population, revenue, and cultivated and waste lands.

India, has been laid before our Society. It is by Mr. BRUCE, and has been transmitted to England, where it will not fail to be appreciated.

Of all the topics of inquiry meriting attention, that of the History and Present Condition of the People, in the different provinces, in regard to language, religion, literature, science and art, means of support, and manners and customs, is paramount. It is very extensive; and has met, from the members of the Society, with considerable attention.

The *Parsis*, the great body of whom dwell amongst us, present themselves as special objects of inquiry. The history of their original country, has been ably unfolded by Sir JOHN MALCOLM; and on its ancient chronology previous to the conquest by ALEXANDER, and its state from the battle of Arbela in A. C. 331, to the rise of ARDESHIR BABEGAN, much light has been cast by our late learned President, Colonel VANS KENNEDY. Mr. ERSKINE's papers respecting them, are remarkably interesting, as containing an able review, and analysis, of the Works of ANQUETIL DU PERRON, who followed Dr. HYDE as the expositor of their tenets; the results of his own observation; and valuable disquisitions on their sacred books and ancient languages. The researches of Professor RASK, in his paper given to this Society, whatever may be the opinions formed of the particular conclusions at which he has arrived, and it must be admitted he has reasoned ingeniously in their support, are also interesting. For the original tracts, with remarks, in the course of being published in France by M. MOHL, we owe our gratitude. The History of the Early Kings of Persia by MIRKHOND, translated by Mr. SHEA; and the History of Vartan and the Armenians, by Mr. NEUMANN; and of the Shah Namah, by Mr. ATKINSON, for which we are indebted to the Oriental Translation Fund, contain much historical information on the religion of ZOROASTER. Still more may be expected from the translation of that singularly curious work, the Dabistan, which is about to appear. The curiosity of the public respecting the Parsis, however, is far from being satisfied, as is evident from the inquiries which frequently reach this place both from London and Paris. We need a more exact translation of the books which they esteem sacred, than that which is furnished by ANQUETIL DU PERRON. Such a translation has been promised by Professor BURNOUF, whose attainments in oriental literature, and ardour in oriental study, afford good ground for hope that our wishes respecting it will be realized. Should he fail, the attempt may be made in Bombay, where there are still a very few Zand scholars among the Zoroastrians to be found, and whose assistance, as well as that to be furnished by the translations into Gujurathi, may be procured*. We require information particularly on their popular superstitions, and domestic manners and customs, and general habits, as exhibited to the native community, and which, there is reason to believe, differ not a little from those generally observed by their European acquaintances, and for which they have received, in the opinion of the most intelligent of their own number, a more than *quantum sufficit* of credit. It was with the view of adding my mite to the information possessed on these topics, and not because I conceived it possessed of any intrinsic merit, that I lately presented the Society with a translation of their General SIROZE. There are extant narratives of their settlement and history in India, versions of which should be presented to the Oriental Translation Fund. At a late meeting of the Committee of Correspondence of the Royal Asiatic Society, some of the more liberal natives in Bombay, were invited to form themselves into an association, with the view of aiding in collecting information on some of the topics to which I have now adverted. Little, I fear, can be expected from them, without the co-operation of

* Six Fargards of the Vandidád can also be procured in Sanskrita.

European scholars, or without the proposal to them of special queries calculated to direct them in their communications. I am decidedly of opinion that it would be of advantage to both parties, were some of them associated with ourselves; and I would fondly hope that should any of them, possessed of competent attainments and zeal, and a respectable character and influence, ask membership of our body, it should be readily accorded.

There is no institution which has furnished more able and interesting illustrations connected with the Musalmáns than our Society. The question, so interesting in the history of the errors of the human mind, Was Muhammad an impostor or an enthusiast, has been discussed by our late President Colonel Vans Kennedy; and though many may dissent, as I myself do, from the conclusion at which he arrives, the ingenuity with which he conducts his argument, and the varied learning which he displays must be readily acknowledged. The same distinguished orientalist has furnished us with the most correct estimate of the literature of the Musalmáns in Persia, which is extant; and has given us a minute and precise abstract of the Muhammadan Municipal Law, with a constant reference to acknowledged authorities, and with an arrangement particularly luminous, being suggested by that of Blackstone in his Commentaries on the Laws of England. His paper furnishes an important aid to the understanding of the state of Government, and society in general, in Muhammadan countries. The points at issue between the *Shias* and *Sunnis*, and which have been, and still are, the cause of the greatest distractions and animosities among the Moslems, are well illustrated by the translations and remarks of Sir John Malcolm; and the sentiments of the *Sufis* and *Mehdivis*, by those of the late Lieutenant Graham and Colonel Miles. The account of the Akhlak-i-Nasiri, by Lieutenant Frissell, and the translation of one of the discourses of Sadi by Mr. Ross, throw much light on the Musalmán Economics and Ethics, both theoretical and practical. What we chiefly want in reference to the Muhammadan religion, is a fuller account, drawn from a comparison of all the existing authorities, of the state of Arabia at the time of its origin, and from which we could form a more enlightened judgment than we do, of those great revolutions brought about by its author; of the history of its religious influence, distinguished as much as possible from that of the military exploits and civil arrangements of its followers, which have hitherto almost altogether engrossed attention; of the general arguments by which its doctors have urged its pretensions in opposition to Christianity*; of the Bohoras†

* Some interesting information on this subject, is to be found in the Controversial Tracts, by the Rev. Henry Martyn, and his opponents in Persia, and the preface prefixed to them by Professor Lee, and in the last of the letters addressed to me, by H'aji' Mahammad H'ashim, and published in Bombay. As the discussion of the points at issue, however, is an ancient one, it seems desirable that a collection should be made of the hints respecting it which are to be found in the Musalmán works of theology.

† To any person, whose leisure may permit inquiry into this body of Musalmáns, the following memorandum written by me on a visit to Surat in the beginning of last year, may not be unacceptable. "The Bohoras of Surat are divided into three sects, respectively denominated Ali, Sulimán, and Dáud. In the first of these, there are only five or six families; in the second, about fifty; and in the third, about five thousand, with a population of about twelve thousand. They have accounts of their tribe, one of which I have seen in Arabic, which carry back their history about six or seven hundred years. They generally support themselves by the vending and manufacture of cloths, hardware, household furniture, &c. They profess to be quite distinct from the agricultural Bohoras, who are to be found in the Baroch districts, and of whom a considerable number of families have now also settled in Surat.

"The Bohoras are under the religious, and, to a great extent, the civil government of a Mullá, whose head quarters were originally in Arabia. The Mullá in

and other curious sectaries; and of the peculiar practices, superinduced probably by intercourse with the Hindus, of those who profess it in India, and particularly in the provinces with which we are most intimately connected. That the latter subject is not unworthy of interest, will appear to any reader of the work lately published by Dr. HERKLOTS, and to the notices given of certain festivals by M. GARCIN DE TASSY. From these documents, as well as from Colonel KENNEDY's paper on the religion introduced into India by the Emperor AKBAR, it appears that the followers of Muhammad, cannot only, when circumstances tempt them, lay aside their intolerance, but accommodate themselves to existing prejudices, and indulge in the boldest speculations. In the almost universal neglect of historical records by the subjugated Hindus, we must principally look to the Musalmáns for any historical information connected with this country which refers to the times which intervene between the commencement of their conquest, and that of the European powers. The History by FERISHTA, translated by Colonel BRIGGS, though neither, as was to be expected, very philosophical nor rigid, is valuable. Captain ROWLANDSON and Dr. BIRD, have done well to translate two works which treat of the history of Malabar and Gujerat. They contain much interesting information. Another history of the latter province, by a very intelligent Bráhman, but principally from Muhammadan authorities, and which may prove worthy of translation, was lately presented to our Society by our zealous Secretary. There are materials to be found, in different places, sufficient to throw light upon the principal occurrences in almost every province of India.

Of various tribes of the Hindus, as the Katis, the Bhíls, the Banjaris, the Pandu Kolis, the Dakhan Kunbis, and the Karadi Bráhmans, and the inhabitants of *Sindh*, very curious notices are to be fouud in our Transactions. Of many other tribes, accounts have appeared in separate publications*. Many more, however, with marked natural pecularities, and in a strange social state, still remain to to be described. Those who

Surat sits upon a throne, and is highly respected. He is thrice saluted by every person wnen he is *in cathedra;* and his attendants give him all the attentions which the princes of the land receive when they are in *Darbár*. He has deputies in all the towns in India where Bohoras are to be found, and even in Maskat, Basora, Jadda, and Mokha. He has a very large income, arising principally from donations at births, marriages, and deaths; but from his funds, the poor of the sect, whether resident in Surat or occasional visitors, are supplied. He nominates his successor, having a principal regard to his talents, information, and capacity to govern.

"The Mullá, or Mulláji as he is called by way of distinction, reads the Korán, and addresses the people during five or six days of the Moharram, and one day during the month of Ramazán, when his auditors are numerous. In the part of Surat principally inhabited by Bohorás, there are many courts, in each of which there is a Mullá to conduct worship early in the morning. The people, however, seem most to relish praying at the tombs, or great mausoleums, which contain the sepulchres of some of the ancient Mullás and their relatives. They actually, as we observed, kiss the chunam covering of the graves!

"In regard to marriage, it may be observed, that the number of wives permitted by the Korán is allowed, as in the case of other sects of Musalmáns. The follies of the Hindus have found a place among them, in the manner in which marriages are contracted and celebrated. Girls are espoused at the early age of five years, and without much regard, on the part of their parents, to the age of those with whom they are united. The processions, and feastings, are conducted much as among the other classes of the natives.

"The shaving off the hair, which is viewed as a kind of sacrament, is performed on the 7th or 21st day after the birth, either of a son or daughter.

"Expulsion from caste follows the practice of gross immoralities, and particularly the drinking of ardent spirits.

"Funerals are conducted with considerable solemnity. Those of the higher classes are attended by the Mullá."

* Among the fullest, and most interesting of these, is the History of the Râmoshis, lately published by Captain MACKINTOSH.

are found resident in tne jungles, and in mountainous districts, and who are probably the remains of the Aborigines of the country, are particularly worthy of investigation. Attention to them is called for, by all who desire to advance their civilization, and to elevate them from their present degradation. Description must precede any considerable efforts made for their improvement. Perhaps some similarities may be discovered in their language, religion, and customs, which may lead to important conjectures as to the ancient history of India. Of many of them it has been already ascertained, that they have had no connexion with Bráhmanism, except in so far as they may have felt its unhallowed influence in excluding them from the common privileges of humanity, and banishing them to the wilds, or dooming them to ignorance, and unwilling and unrewarded servitude*.

Though on the Hindu religion and literature in general, our publications contain rather scanty observations, some of our members have added greatly to the information communicated by the distinguished literati of the other side of India, and of Europe. Our Society was the first body to submit to the public a proposal for a union for the promotion of translations from the Sanskrita. Its claim to this honour, it is right again to re-assert. It will be established by a reference to a letter addressed to the Asiatic Society of Bengal, in 1806, by Sir James Mackintosh, and published as an appendix to the first volume of our Transactions†. Such translations were practically encouraged by the Society itself, in the case of the Liláwati, a treatise on Arithmetic and Geometry by Bhaskara Acharya, and the Prabodh Chandrodaya, a curious allegorical play illustrative of the opinions of the Vedantikas, and both published by the late Dr. John Taylor. The first general account, of any considerable size, of the Hindu Pantheon, is by one of our members, Major Edward Moor. In Colonel Kennedy's Ancient and Hindu Mythology, we have a work, than which none more important, if we refer either to original quotations from the *Shástras*, or learned disquisitions, has yet appeared. I make this remark with the more freedom, that circumstances called me, on the publication of the work, to animadvert on the estimate which it forms of the moral character of Bráhmanism in a manner which gave the learned author offence. In the Essay on the Vedanta by the same gentleman, we have the best account of that very curious system of speculation, considered in a philosophical point of view, which has yet appeared,—an account which proves it to be a system of spiritual pantheism, and as such entirely different, except in occasional expression, from that of the Mystics of Europe, to which it had been maintained to be similar by Sir William Jones, and other writers‡. It was in this place that the first defence, by a Native, of both the exoteric and esoteric systems of Hinduism, in reply to those who seek to propagate the principles of our Holy Faith, appeared; and it was here that a rejoinder, embracing briefly the consideration of

* See particularly Mr. Baber's Answers to the Queries of a Committee of the House of Lords on the state of Slavery in the South West of India.

† Page 310.

‡ In the works of the Mystics, and of the pious writers, to whom Sir William Jones alludes in the course of his reasonings, there are figures of speech, and other expressions, very similar to those used by the Vedántists. Others, still more strikingly similar, could easily be produced. I give one from the Poems of Richard Baxter.

"But O! how wisely hast thou made the twist!
To love thee and myself do well consist.
Love is the closure of connaturals;
The soul's return to its originals:
As every brook is toward the ocean bent:
And all things to their proper element:
And as the inclination of the sight,
How small soever is unto the light:

both these subjects, was published. About two years ago, a portion of the *Rigveda*, the most considerable which has yet been printed, was published in *Sanskrita*, *Marathi*, and English, by one of our members. A translation of the whole of this work, to which I believe Prof. H. H. WILSON has turned his attention, and of the *Bhagawata Purána*, which, though it cannot claim an antiquity much exceeding that of six hundred years, is certainly the greatest practical authority at present, at least in the West of India, are greatly to be desired. On the different sects of the Hindus, and on their provincial superstitions, much light has yet to be cast. On the North of this Presidency, we have the *Vaishnavas ;* in our immediate neighbourhood, the *Smartas ;* and in the South, the *Shaivas* or *Lingavants*, in the practice of all their peculiarities. In the Dakshan, we have a general worship of deified heroes, as yet unnoticed, except in the most incidental manner. Many curious classes of mendicants, of whom little or nothing is known*, are to be found within the sphere of our peculiar observation. The religion of the Jainas, on which most valuable manuscripts, procured by Mr. WATHEN, are deposited in our library, is still, in many respects, to be unfolded. Our Transactions have only one paper, by Captain MCMURDO, which refers to it. In the possession of the Jainas, there are many works calculated to throw much light on the religious history of India in general, with the use of which some of them would not be unwilling to favour a European student. I fondly trust and believe, that there are among our members, those who will continue to contribute, as circumstances may call them, to the exposition of the systems of faith, which have so long exercised their sway in this country, and the various literary works, which, though, unlike those of Greece and Rome, they are of little or no use in the cultivation of taste, are valuable as they illustrate the tendency of these systems in their connexion with social and public life, and as they explain a language the most copious in its vocables, and powerful in its grammatical forms, in which any records exist. Destitute of a knowledge of these systems, and the works in which they are embodied, the native character, and the state of native society, will never be sufficiently understood, a right key obtained to open the native mind, and all desirable facilities enjoyed for the introduction among the people of a body of rational and equitable law, and the propagation of the Gospel and the promotion of general education. There are some respectable patrons of the latter supremely important work, who overlook its importance ; but their number is on the decrease.

> As the touch'd needle pointeth toward the pole ;
> Thus unto thee inclines the holy soul :
> It trembleth and is restless till it come
> Unto thy bosom where it is at home."

No person who is familiar with the *Upanishads* can fail to mark the coincidence of the language of BAXTER in the preceding passage, with that of the Transcendentalists of India. This coincidence of language, however, does not warrant the inference that there is the least agreement of statement. In proof of this position, we have merely to quote the lines which follow those now given.

> " Yet no such union dare the soul desire
> As parts have with the whole, and sparks to fire ;
> But as dependent, low, subordinate,
> Such as thy will of nothing did create.
> As tendeth to the sun the smallest eye
> Of silly vermin, or the poorest fly.
> My own salvation when I make my end,
> Full mutual love is all that I intend,
> And in this closure though I happy be,
> Its by intending, and admiring thee."

* Of one of these, the *Mánbhavas*, whom I had particularly in view in making this remark, I have just received an interesting account from Captain A. MACKINTOSH, the author of the History of the Ramoshís.

They ought to consider that the situation of those to be instructed, is to be attended to, as well as the instructions to be delivered. While divine truth must be propagated with unwavering fidelity, and all hopes of ultimate success rest on its own potency, its suitableness to the general character of man, and the assistanee of divine grace, judgment ought to be employed in the mode of its application to those who vary much in their creeds, and differ much in their moral practice. We have the highest authority for an accommodation such as that for which I plead. Though the great truths proclaimed by the apostle PAUL were the same in all circumstances, they were introduced in very different ways to the Jewish Rabbis and people, and to the members of the Athenian Areopagus. I must hold, that there is no little unsuitableneas in India, in addressing a Pantheist as a Polytheist, and *vice versa:* in speaking to a Jaina as to a Bráhman; in condemning that at random which the natives may suppose to be unknown, and in using theological terms, and general phrases, without any very definite sense of their application by the natives themselves. The more a knowledge of Hinduism and of Hindu literature is possessed by any teacher, the more patiently and uninterruptedly will he be listened to by the people, and the more forcibly will he be enabled, and principally by contrast and concession, to set forth the authority, and the excellence, of the doctrines of Christianity.

In connexion with the subject to which I have now adverted, I may allude to the peculiar duty which devolves on us of collecting Sanskrita manuscripts. They are to be found in a purer state in the Dakshan than in any other part of India, and the poverty of the Bráhmans leads them readily to part with them. Those which were lately purchased by us are very valuable.

The contributions of the members of our Society to the elucidation of *Hindu Antiquities*, have done much to extend and support its credit. The proximity of the ancient excavations, which may be classed among the wonders of the world, could not fail to excite curiosity and inquiry. The descriptions and illustrations of those of *Gharipur* (Elephanta), *Sashti* (Salsette), *Karali* (Carlee), *Verula* (Ellora), *Bag* and *Ajanta**, though a few errors and oversights may be detected in them, are highly interesting. Mr. ERSKINE has satisfactorily shown the distinguishing characteristics of those of them which are respectively to be attributed to the Baud'dhas and Jainas, and the Bráhmans. It is to be hoped that the inscriptioas which are to be found on some of them, and which are in the Sanskrita language, and in ancient characters very similar to those which have lately been published in the ably conducted Journal of thc Asiatic Society of Bengal, will be soon understood. The Rev. Mr. STEVENSON has already been successful, to a great extent, in decyphering, and translating those of the temples of Karali, and thus leading to inferences by no means unimportant. Some of those of Kanadi, on Salsette, I should think, from a partial trial, present no greater difficulties than those which have been already overcome. The stone bearing the inscription of the temples at Elephanta, we learn from DIEGO de COUTO the Portuguese Annalist, was sent to JOHN the Third of Portugal about the year 1534, and is probably now either in the Royal Museum of Lisbon, or in the University of Coimbra. The Royal Asiatic Society may, without difficulty, procure a transcript. There are excavated temples in the country, such as those of Nasik, and Junar, and others which have been erected, such as those of Abu, Palitana and Girnar, which have not yet been particularly described. What we principally require in reference to them all, is information as to the time at which, and the views with which, they were constructed; an estimate of them as works of art, or as indicative of the resources of those to whom they are to be ascribed; and an inquiry into the religious rites and services, for which they have been appropriated, and the moral impressions

* Written by Messrs. SALT, ERSKINE, Col. SYKES, &c.

which they seem fitted to make on those resorting to them. They are worthy of attention only as they may illustrate the civil and religious history, or practices, of the country. The grants of land, engraven on copper-plates, many of which are still to be found in different parts of the country, are next to them in importance in the advancement of antiquarian research. One of these was translated by Dr. TAYLOR. Mr. WATHEN has been successful in decyphering the most ancient of those in our museum; and the results, as stated by him in his communication in the Journal of the Asiatic Society of Bengal for August last, are both curious and useful. Ancient coins are occasionally found in different parts of the Presidency, and the Native States to the northward, which may aid in the correction, or enlargement, of such Genealogical Tables as have been lately published by Mr. PRINSEP of Calcutta*.

There is a small body of *Armenians* in Bombay, from which something interesting might be learnt. A dissertation by one of them on the antiquity of their native language, with notes by Mr. DICKINSON, has lately been transmitted by us to the Royal Asiatic Society, and cannot fail to be acceptable. There cannot be a doubt that the Armenians can fill up important blanks in our Church History, which, to the undue neglect of the orientals, is principally formed on the authority of the Roman and Byzantine Fathers.

The *Beni-Israel* of Bombay, and the adjoining territories, amount to about eight thousand. It is to be regretted that no considerable account of them has yet appeared, particularly as they have been long settled in the country, refuse the appellation of *Jew*, and are probably a portion of the Ten Tribes, never amalgamated, as the body of them probably was, with those of Judah and Benjamin.

The researches of our members on antiquities, and other subjects of observation and rational inquiry, have not been confined to India; but I cannot longer detain you by alluding either to their results, or by attempting to form, what is unnecessary, and what in me would be presumptuous, an estimate of the enterprize and intelligent observation and research of our MALCOLMS, ELPHINSTONES, POTTINGERS, RICHES and BURNESES. The contiguity of our Presidency to Persia, Arabia, and Egypt; and the prospect of increased intercourse with these countries, by steam navigation, afford ground to hope that our geographical and historical knowledge of them will ere long be greatly enlarged. There is scarcely a country of Asia, which, even, in our present circumstances, does not furnish visitors to Bombay, who prove themselves ready to communicate to intelligent inquirers, information on places never as yet surveyed by any modern European traveller. Mr. WATHEN has been able, from conversing with Muhammadan pilgrims, to prepare a brief, but interesting, memoir of Chinese Tartary†.

I owe to the meeting an apology for the many imperfections of the sketch which I have rapidly taken. I have rather endeavoured to mark our progress, than to point out, what would perhaps have contributed more to our encouragement, the advantages and means of further advancement. Our Society, I may be permitted to hope, will soon again be inspired with its pristine zeal, at the same time that it is directed by its accumulated experience; maintain the character which it has earned for itself; and prove not unworthy of its incorporation with the Royal Asiatic Society of Great Britain and Ireland, an incorporation which must be admitted, notwithstanding some disadvantages, to be beneficial, as it secures that literary sympathy and communication which is greatly to be valued, and the circulation of our papers, with no expense to ourselves, and now in a convenient form, throughout the world.

* Such coins are occasionally worn as personal ornaments by natives, who have no idea of their value.

† See Asiatic Society's Journal for December, 1835.

XIV.—*Miscellaneous.*

1.—*On the Canis Vulpes montana, or Hill Fox. By* J. T. Pearson, *Asst. Surg., Cur. Mus. As. Soc.*

[Reprinted from the Bengal Sporting Magazine, Jan. 1836.]

Cl. *Mammalia*, Cuv. Gen. *Canis*, Auctorum.
Ord. *Carnassiers*, Cuv. Sub-gen. *Vulpes*, Auctorum
Fam. *Carnivora*, Cuv. Sp. *Canis Vulpes montana*, mihi.

Rufous grey fox, with black throat, and tail white-tipped.

Description.—Size, length from tip of the nose to the insertion of the tail, 2 ft. 6 in.; length of tail, 1 ft. 7 in.; height at the shoulders, 1 ft. $1\frac{1}{2}$ in.

Colour:—general colour, rufous on the upper and fore parts of the body; becoming grisly behind, at the sides, and at the sides of the tail; behind the ears, rich velvetty black, edged at the outer middle third with short velvetty fur of a light fawn colour, and at the inner upper third, with light rufous; tip of the nose, as is usual in the genus, black and naked: upper lip white, with a few black bristles, and a narrow band of white extending along just above the margin, which is brown, to the corner of the mouth, where it widens and unites with a somewhat similar but fainter band from the angle of the lower jaw, from which junction the white proceeds along the side of the throat as far as the shoulder, forming a boundary between the black of the throat and the pale fawn colour of the side of the neck. A greyish black irregular spot, upon which the whiskers are set, is situated at the side of the muzzle from near the nose to the eye, and extending behind in the form of a line to the root of the ear, where it takes an abrupt course downwards, and is lost under the chin; middle of the nose and crown of the head, greyish rufous; inside the ears, side of the neck, and half the side behind the shoulder, (mid-way between the shoulder and hip) and the flank, light fawn colour, with a dark rufous band extending from between the ears to the middle of the back, where it becomes less distinct, and is continued along the upper side of the tail as far as the white tip. This longitudinal band is crossed by another over the shoulders, forming a well defined cross; shoulders, outer sides of the hind legs, and sides of the tail, dark grisly grey, partaking at the edges of rufous; outer, and back part of the paws, tan, with toes of mingled rufous and black,; throat, chest, fore part of the belly and inner side of the thighs, dusky black, having a few white hairs, interspered under the throat, a white triangular spot on the chest, an approach to a rufous tint on the belly, and being bounded by a white line in front of the thighs and hind legs. The remaining under surface, hinder part of the fore-legs, and under side of the root of the tail, is of a light fawn, approaching in some parts to an Isabella colour. Tail, dark rufous, waved with black above, grisly grey at the sides, fawn colour, gradually becoming waved, with black, underneath, and furnished for about the length of three inches with a white tip.

The general ground colour of the fur is a dingy back, or dirty white, according to the shade of the part. It is long, thick, soft, and very warm, mixed with a few strong hairs; it varies in length from an inch to one inch and half upon the neck, sides, and back. Upon the muzzle, shoulder, and outer side of the thighs, under the chin, and on the limbs, it lies close, and is short; while behind the ears, it is very short, and has the gloss and softness of velvet. The tail is exceedingly bushy, some of the fur being full two inches in length, and at the tip, more than three.

The hill fox appears to approach the marking of the *C. Decussatus* (cross fox) in the dark colour of a portion of the under parts, and in the cross over the back and shoulders; but the cross is not black in this species, as it is described in that. It is of a bright rufous colour in this,

and is rendered particularly distinct by the light fawn colour at the sides of the neck and behind the shoulders. The perpendicular stroke of the cross is 2½ inches wide upon the back of the neck, and two inches immediately behind the shoulders, while further back, it is wider, but indistinct. The cross band is two inches and a half wide, and very distinct, until lost on the shoulders in the mixture of rufous and grisly grey of that part.

The hill fox is a very handsome animal. Its colours are, for the most part, bright, and often well defined at their edges, offering a strong contrast with those adjoining, or, as upon the neck and anterior part of the thighs, separated from one another by a narrow distinct line of white.

It seems to be intermediate between the *Vulpes vulgaris* (common fox) and the cross fox, which, indeed, may, after all, be probably varieties of the same species.

As nothing is known of the habits and manners of this animal, it would be conferring a boon upon zoological science, if any person, well acquainted with the subject, would describe them. It is said to be a native of the lower range of the Himálayan mountains.

2.—*On the Soil suitable for Cotton, Tobacco, Sugar, and the Tea plant.* *By* H. PIDDINGTON.

[Read at the meeting of the Agricultural Society, March 1836.]

I preface what I have to say to the Society on the soils placed on the table with a few remarks, which I trust may be thought worth placing on record. My object in doing so is again to impress upon members of what vital importance it is to the advancement of the agricultural interests of the country, and to the safety and success of every agricultural speculation, to procure samples of all soils from other countries in which valuable products grow.

The same climate and soil are, we know, in a greater or less degree the essential requisites for obtaining the production of one country in another; and for our present purpose we may perhaps say that plants *find* their food in the soil, and are enabled to *digest* it by the climate. They *do* digest, we know, and this in the strictest sense of the word.

The popular ideas of climates are vague enough, but it may be roundly asserted, that scarcely one who uses the word knows what is really meant by soil; or rather what is really meant by "the *same* soil." This arises from our vague notion of the thing itself. The very words used to distinguish soils express, more frequently than any thing else, their appearance, and some of their physical qualities; scarcely any their essential—that is their chemical properties. We talk of light and heavy, of sandy and clayey, moist and dry soils, which are all physical properties, and two clayey or two sandy soils may be actually as different as light and darkness from each other! The words ferruginous and calcareous are, it is true, chemical terms, but such vague ones that they designate whole *classes* of soils, of which each sort is widely different from its neighbours. The tea soils and the Arracan tobacco soils on the table are both ferruginous soils, but differing as widely as soils can do; for the iron in the one is a carbonate of iron, and in the other the red oxide of iron.

COTTON—Nothing then but a sample of the soil and a correct analysis of it can assure the speculator, that while he is trying to rear any given foreign product, he is not (misled by loose names) absolutely blundering in darkness, and attempting an impossibility. I begin with Cotton as a most prominent example, though my proofs on the subject are not quite so full as I could wish; and I shall surprise the Society not a little when I say, that all the expensive efforts which have been made hitherto to obtain good cotton have probably failed from this one cause, *that we have been at work on the wrong soil!* How far, with the American cottons, differences of climate may also have operated is not here the place to examine,

but vegetable productions do, to a great extent, acclimate themselves; while it is probable that nothing can compensate to them the want of a principal constituent of the soil. Now I have not been able to obtain specimens of the American cotton soils, but I have good authority for stating that the soil of the Sea Islands is wholly a calcareous sand—in other words a light chalky or shelly soil; so that it may probably contain from 50 to 60 per cent. of calcareous matter (lime generally in the state of chalk), and we have been attempting to grow this cotton on a soil which barely contains a trace of it! The soil of the Botanic Garden, for instance, not containing more than 1½ or 2 per cent.: Indeed we may say generally, that till we reach the *kankur* districts, none of the soils of lower Bengal, out of the reach of the inundations, contain any great portion of lime. I showed some years ago*, that the inundations deposit lime, and that much of the fertilising effect they produce is due to it.

The American cotton is, then, on account of differences of climate, a case not strictly in point, but the Bourbon cotton—grown both at Bourbon and the Mauritius—which sells for a shilling, when the Sea Island sells for 13*d.* and the Manilla cotton, which sells for 11*d.* when the Bourbon is worth a shilling, are both cottons of hot climates like our own; and both these are grown in highly calcareous soils. The soil on the table before you is from the Mauritius; it is sent me by M. Geneve, of La Riviere Noire, one of the finest estates on the island, as an excellent cotton soil, and contains 32 per cent. of carbonate of lime, (or in plain English, one-third chalk;) there is, moreover, phosphate and perhaps not less than 40 per cent. of calcareous matter! Its iron too is in a peculiar state, that of protoxide or the black oxide of iron; and in this respect, it probably resembles the black cotton soils of Southern India. No wonder that the Bourbon cotton, though it grows well in many of our gardens near town, where it meets with plenty of calcareous matter amongst the lime-rubbish with which most of them are filled, is said to degenerate when cultivated in the open fields, which do not contain 2 per cent. of lime. I know, from the experience of several years, that it does *not* degenerate if it is duly supplied with calcareous matter; but that it will produce most abundantly, and for years, cotton worth from 10*d.* to 11*d.* per lb. in a proper soil. If the soil does not suit it, it will produce little else than leaves and wood, and the staple will deteriorate. Samples of American cotton soils are wanting now to make our theory on this head perfect; but I would advise no man to attempt foreign cottons in a soil containing less than 15 per cent. of lime, and its iron mostly in the state of protoxide or black oxide.

Tobacco.—Tobacco soils are the next, and here we are more fortunate, for there are on the table soils from Arracan (Sandoway); a soil from Singour in Burdwan, near Chandernagore, the tobacco of which, though of the same species as that of the surrounding country, sells at the price of the Arracan sort! and the soil of the best Bengal tobacco, which is grown at and about Hinglee, in the Kishnagar district, near factories formerly held by me. Col. Hazeta and Dr. Casanova are our authorities for saying, that the tobacco soils of the Havanna are *red* soils, and those of Manilla, I know, are also *red* soil. Now the red and reddish brown soils contain most of their iron in the state of peroxide, or the reddish brown oxide of iron; while the light-grey soils contain it only in the state of protoxide, or the black oxide of iron. I believe the quality of the tobacco to depend mainly on the state and quantity of the iron in the soil; while it is indifferent about the lime, which we have seen is so essential to cotton. None of these tobacco soils contain any lime. Their analysis shows them to contain:—

* Trans. of the Phys. Class, As. Soc. Vol. I.

	Aracan soil.	*Singour soil.*	*Hinglee soil.*
Oxide of iron (peroxide).....	15.65	10.60	6.00*
Water and saline matter.....	1.00	0.75	1.50
Vegetable matter and fibres.....	3.75	1.10	.75
Silex.....	76.90	80.65	87.25
Alumina.....	2.00	4.50	1.50
	99.40	97.69	97.00
Water and Loss.....	.60	2.40	3.00
	100.0	100.00	100.0

—from which it will be seen that the best tobacco soil we have hitherto found in India contains 16 per cent., or nearly one-sixth, of iron, which is mostly in the state of peroxide, and that the inferior sort of tobacco grows in a soil containing only 6 per cent., one-sixteenth of iron of which is moreover mostly in the state of protoxide or black oxide.

I thought it worth examining what the quantity of iron in the different sorts of tobacco would be; and I found that, while the ashes of one ounce, or 480 grains, of Havanna and Sandoway cheroots gave exactly 1.91 grains or 0. 40 per cent. of peroxide of iron, the ashes of the same quantity of the Hinglee or best Bengal tobacco only gave 1.50 grains or 0.32 per cent., and it appears to exist in the first two in the state of peroxide. and in the last, as a protoxide, of iron; rendering it highly probable that the flavour of the tobacco to the smoker depends on the state and quantity of the iron it contains! for we have now, observe, traced the iron from the soil into the cheroot. Green copperas water, which is a solution of sulphate of iron, is often used by the American and English tobacconists and planters to colour and flavour their tobacco; and this would be decomposed by the potass of the tobacco, and sulphate of potass and carbonate of iron be formed. Carbonate of iron is of an ochre yellow colour. I took care to ascertain that this process had not been performed with the cheroots used for my experiment; and I do not believe our Bengal cheroot-makers know of this method.

SUGAR.—Sugar seems to depend both on the state of the iron and on lime in the soil. The sugar soil before you is also from the Black River, (Mr. GENEVE's,) an estate upon which from 3000 to 7000, and even on one spot the astonishing quantity of 12,000 lbs. of sugar have been obtained from an acre, of from 12 to 150 bazar maunds per bigah! Captain SLEEMAN is my authority for these statements.

Now the peculiarity of this soil is, you will observe, that it is a *red* soil, i. e. that its iron is mostly in the state of peroxide; and it contains moreover about 9 per cent. of carbonate of lime, with probably some sulphate and phosphate of lime, say perhaps altogether 10 or 12 per cent. of calcareous matter. We have in many instances endeavoured to cultivate this cane on soils destitute both of peroxide of iron and lime, and we complain that the cane has been found watery. It is clear that the cultivator who would succeed in sugar should pay attention to these peculiarities; for without doing so he may have *returns*, but often no profits. His profits, in a word, may depend upon his canes, his cotton, or his tobacco, being *fed* with the food which they require. I used the words *feed* and *digest* because it cannot be too often repeated that plants are living beings, and that the vigour of their life depends, as with ourselves, on abundant and suitable food.

TEA SOILS.—The tea soils, though I notice them last, are not the least interesting. The first is a soil from Assam, for which I am indebted to Captain JENKINS; and the second is from the Bohea Hills in China, sent

* Mostly protoxide.

round by Mr. Gordon, the Secretary to the Tea Committee, and obligingly given to me by Mr. Grant, of the Honourable Company's Export Warehouse. How very alike they seem, you will at once have noticed, and their analysis gives as follows:—

	Tea soils of Assam. Surface soil.	At 2½ feet deep.	*Tea soil of China.*
Water	2.45	2.00	3.00
Vegetable matter	1.00	.80	1.00
Carbonate of Iron	7.40	6.70	9.90
Alumina	3.50	5.45	9.10
Silex	85.40	84.10	76.00
	99.75	99.05	99.00
Traces of phosphate and sulphate of lime and loss,	.25	.95	1.00
	100.0	100.00	10.000

There are two peculiarities in these soils; the first, that they contain no carbonate of lime, and only traces of phosphate and sulphate; and the next, that their iron is almost wholly in the state of carbonate of iron—a widely different compound from the simple oxides. They would be called poor yellow loams; and cotton, tobacco, or sugar-cane would probably starve upon them: but we find that they suit the tea plant perfectly. It is a striking coincidence, that we should find our tea soils and those of China so exactly alike.

I fear to grow prolix, though I have much more to say on the subject of soils; I shall therefore break off, trusting that for the present I have amply shown the necessity of a careful examination of the soil; and that the commercial public, who can do so much for us in this way, will not neglect their own interests in procuring specimens of soils for us; for to go to work in ignorance of this great element of success, is absolutely to blunder on in the dark where chemistry would lend us an unfailing light.

[We have also received specimens of the tea soils for analysis, but for want of space must postpone the notice of our results, which agree for the most part with Mr. Piddington's. We have also an analysis of the Assam tea soil by Dr. McClelland.—Ed.]

3.—*Action of Copper on Ink.*

A curious case lately came under my notice of the effect of saline moisture and copper united on writing ink. The Bengal Bank referred to my examination three bank notes sent in by a native, who protested he knew not how the numbers and signatures had disappeared; that he had left them in a small copper box on his departure into the country, having precisely noted the amounts and numbers—and that on his return they were thus altered. The Secretary of the Bank disbelieved the marvellous statement, because the endorsements remained untouched.

I conceived it would be very easy, at first sight, to restore the writing by the usual method of slightly acidifying the paper, and then testing with prussiate of potash, which if the smallest traces of the iron remained, would develope the letters in blue. The only effect however of the application of this re-agent was to develope a copious red-brown upon the entire surface of the paper, proving how strongly it had been impregnated with a solution of copper:—in one of the three papers there was a general faint blue where the signature might be expected, but not the faintest trace of a number or letter could be recovered. It immediately occurred to me, that a solution of copper would in fact dissolve away the iron while it deposited the copper, and thus leave none of the former metal to be acted upon by the prussiate. To prove this point beyond a doubt, I select-

ed paper containing black writing that had stood for many years uninjured and placing it between two clean copper plates, allowed a current of acidulated water to pass through. In a minute or two the whole writing disappeared, and could not be restored by the prussiate; although where the colour of the ink was merely discharged by acid, the usual effect was manifest. The native ink being carbonaceous remained uninjured throughout; and where even a slight proportion of this ingredient was mixed with the English ink, the removal was so far prevented. This circumstance presents a ready mode of obviating such accidents for the future, for the present is not, it appears, the first occasion of the kind. A poor native pilgrim took some notes to Jagannáth in a small copper roll kept on his person for safety. After the customary period of bathing in the sea, he returned, and found his notes effaced, nor would the bank at that time make them good to the unfortunate holder.

The preventive alluded to is simply to mix Bengálí or Indian ink, half and half, with the English metallic ink. I have long been in the habit of doing so for the labels of mineral cabinets, where it is known that pyrites and other substances frequently obliterate the traces of common writing ink. J. P. *Sec.*

4.—*Suspension Bridge at Fribourg in Switzerland.*

[Having alluded in the last number to this surprising work on the authority of private descriptions just received from relatives in Switzerland, we imagine our Engineer friends in this country (so many of whom we are proud to reckon among our readers) will be curious to hear more of it. We therefore hasten to extract the following account from JAMESON'S Edin. Phil. Journal*.—ED.]

The town of Fribourg is built on the left bank of the Sarine. Both sides of this small stream are very steep; and rise to the height of about 220† feet above its bed; and travellers coming from Berne to Fribourg were formerly obliged to descend the hill, in order to reach a small wooden bridge which crosses the river, and immediately after by a steep ascent of about 200 feet to reach the top of the opposite bank before coming to the centre of the town. The passage through Fribourg thus occupied nearly an hour; but the case is changed since the erection of the new suspension bridge.

These difficulties and delays were long considered the unavoidable consequence of the local situation of the town, until some bold spirits conceived the idea of uniting, by means of a suspension bridge, the steep banks of the Sarine. It was necessary that the bridge should pass over a great part of the town itself, and the scheme was considered completely utopian; yet certain of success, the authorities and some active citizens determined to submit the measure to the consideration of engineers of different districts. Various designs were accordingly offered, and the government of the canton gave the preference to that of M. CHALLEY, of Lyons, whose plan has since been executed under his immediate superintendence.

The gateways at either end of the bridge are of Doric architecture, and are about 65 feet in height. The tops of their arches are about 42 feet above the roadway, and the arches have a span of 20 feet. The masonry of the gate is 46

* We take this opportunity of correcting a few errors in our observations on the Roof of St. PETER'S Church in the Fort.

1. The central vault had not opened in the vertex from *end to end*, but only a little towards the east end. We remembered having seen it apparently cracked, but this was merely from the knocking away of the Gothic moulding to examine its state—Its firm condition should have been an additional argument against condemning it.

2. The present groined roof of the nave has *not* a flat roof above it, this is confined to the side aisles.

3. We understand that the additional expence to Government has been only about one-third. We alluded however only to the *roof*, in supposing that the cost had been "doubled or tripled."—ED.

† All the measurements have been reduced from French to English agreeable to the ratios given in the Annuaire du Bureau des Longitudes.

feet in width, and its thickness is about 20 feet; although the largest blocks of the hard limestone of Jura were employed in this work, iron cramps were used to complete the union of the stones, and above 24 tons of iron were used for this purpose.

The width of the valley of the Sarine at the point where the bridge is built, or, in other words, the distance between the inner face-work of the two gateways on either bank of the river, and consequently the span of the suspended roadway, is 871 feet. It may be easily conceived that a good deal of doubt was entertained as to the propriety of trusting to a span of so great an extent, and the idea of suspending the bridge at the middle at first occurred to M. Challey as the best mode of forming the communication. On weighing the difficulty, however, of obtaining a solid foundation for a pier 220 feet in height in the bottom of an alluvial valley, he soon relinquished this idea; and the bridge has therefore been constructed with a single span of 871 feet.

The roadway is suspended in the manner now universally known, by four cables of iron wire* passing over the upper part of the gateways. Each cable consists of 1200 wires, each about $\frac{1}{10}$ inch in diameter, and 1140 feet in length. To avoid the difficulty of moving these heavy cables, each wire was brought separately to its place, and they were united on the spot by the workmen, who were suspended during the work. We are happy to add, that no accident of any kind occurred during this operation. It is calculated that the four united cables are capable of sustaining a weight equal to 2946 tons.

The four cables are fixed in chain-pits or shafts cut out of the solid rock on either side of the river. In each of these pits four cables pass through a vertical cylindric chimney or pillar, which bears three heavy domes resting upon it, and at the same time abutting against grooves cut with much care in the rock to receive the springing stones. At the bottom of the pillars the cables are made fast to blocks of very hard stone, which are cubes of $6\frac{1}{2}$ feet. The cables, therefore, cannot slide without lifting the whole of these enormous buildings, strengthened as they are by their connexion with the solid rock.

M. Challey began this work in the spring of 1832. He brought out of France, we think, only a foreman who had assisted him on former occasions, and engaging in this arduous enterprise with the inexperienced workmen of the country† who had never seen a suspension bridge, he completed the work in spite of all these difficulties; and on the 15th October 1834, fifteen pieces of artillery drawn by forty-two horses, and surrounded by 300 persons, crossed the bridge through; they united in one body as well on the middle as at the ends of the roadway. Nor was the least appearance of derangement of the structure discovered on the closest examination. Some days after the whole inhabitants of Fribourg and its suburbs passed over in procession, so that there were no fewer than 1800 persons on the bridge at the same time; and all classes of travellers, mercantile and curious, have since united with the natives of the Swiss cantons in testifying their entire satisfaction with the bridge. Although the severe proof to which constructor of this work subjected it, by loading the roadway with about 20 lbs. on each square foot, did not take place till the month of October 1835, yet it may safely be said that the colossal bridge of Fribourg was completely finished in two years and a half. The whole expense was only about £.24,000.

The only bridge which can be compared for its dimensions with that of M. Challey is the Menai or Bangor bridge, which joins the Isle of Anglesea to the main land of England. The largest vessels sail below it with full canvass set. It was constructed by the celebrated Engineer Telford; but the Menai bridge is only 550 feet in length, while the bridge of Fribourg is 871 feet. The roadway of Mr. Telford's bridge is about 106 feet above the level of high water, and M. Challey's 167 feet above the level of the river Sarine.

* It is not perhaps generally known that in all the suspension bridges in France ropes formed of wires are employed, instead of the solid links used in England.

† This remark reminds us of the Ságur bridge built by Col. Presgrave under difficulties so much superior.—See vol. II. p. 538.—Ed.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of May, 1836.

Day of the Month.	Observations at 10 A. M.									Observations at 4 P. M.										Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Wet Barometer at 32°.	Difference.	Thermometer in air.	Wet-bulb Thermom.	Leslie's Dif. Hygrom.	Dew point at 9 A. M.	Hair Hygrometer.	New Stand. Barometer red. to 32°.	Old Stand. Bar. at 32°.	Wet Barometer at 32°.	Difference.	Thermometer in air.	Wet-bulb Thermom.	Leslie's Dif. Hygrom.	Dew point at 2 P. M.	Hair Hygrometer.	Cold on roof.	Heat in sun on roof.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	4 P. M.	
1	29,717	,751		Sul. A.	88,9	81,5	7,1		93	29,573	,614		Sul. ac	96,5	79,8	17,6		70	76,1	110,4		sw.	sw.	s.	cumuli.	clear.	clear.	
2	,699	,732		Sp. gr.	88,6	76,5	12,4		79	,556	,611		1,83	97,1	78,2	18,7		63	74,5	109,0		sw.	sw.	S.	cir. cum.	do	fine.	
3	,670	,702		1,33	88,8	74,7	13,0		79	,527	,532	29,598	+,071	99,0	71,9	27,3	51,0	56	72,3	117,1		SW.	sw.	sw.	do	do	close.	
4	,633	,648	29,690	+,057	89,8	79,3	10,7		89	,470	,519	,533	+,063	95,4	76,0	18,9	54,0	70	75,4	112,0		SW.	sw.	sw.	cumuli.	do	fine.	
5	,591	,612	,638	+,047	90,0	81,6	7,5	75,2	95	,550	,501	,500	+,050	94,8	82,6	12,0	69,5	84	77,0	103,5		SW.	sw.	sw.	do	do	cumuli.	
6	,598	,616	,640	+,042	89,8	82,8	6,7	76,8	98	,444	,501	,493	+,049	96,2	82,3	13,7	60,0	80	78,6			e.	sw.	sw.	scud.	fine.	fine.	
7	,593	,616	,624	+,031	88,5	81,4	7,5	75,1	95	,464	,519	,505	+,041	94,7	82,5	12,7	72,5	83				S.	S.	S.	scud.	do	do	
8	,602	,628	,622	+,020	89,7	82,3	7,4	76,2		,470	,507	,477	+,007	1001	84,2	17,6	71,5		77,9	104,2		S.	sw.	sw.	hazy.	do	do	
9	,622	,659	,622	+,000	89,9	79,8	10,0	75,1		,480	,555	,482	+,002	1013	72,3	30,4	50,		78,7	132,5		sw.	sw.	sw.	clear.	do	do	
10	,591	,613	,579	—,012	88,7	80,7	8,3	75,4		,469	,527	,447	—,022	98,9	81,7	16,9	60,5		77,5	119,2		sw.	sw.	sw.	do	do	do	
11	,660	,683	,621	—,039	88,7	79,8	9,6	75,3		,544	,605	,505	—,039	99,6	75,6	24,8	57,0		75,9	119,0		sw.	se.	sw.	cumuli.	do	misty.	
12	,758	,800	,704	—,054	89,1	81,1	9,7	74,9		,613	,673	,545	—,068	98,4	80,3	17,5	70,0		77,0	123,8		SE.	se.	se.	do	cum. strat.	cir. cum.	
13	,744	,787	,664	—,080	91,1	81,3	10,6	74,0		,620	,605	,538	—,082	95,7	80,5	14,3	74,0		77,2	102,0		E.	se.	e.	do	do	hazy.	
14	,693	,745	,584	—,109	88,9	80,0	9,7			,530	,615	,441	—,098	94,4	80,9	14,0			76,2	106,5		se.	se.	se.	do	do	cir. str.	
15	,594	,638	,466	—,128	89,5	81,4	7,6	75,5		,458	,521	,332	—,136	96,1	82,2	7,0			78,5	104,8		s.	se.	s.	do	cumuli.	hazy.	
16	,532	,581	,387	—,145	91,1	84,1	6,0			,440	,498	,294	—,146	95,6	85,4	8,9	76,0		80,8	96,8		ssw.	ssw.	sw.	hazy.	fresh breeze.	fine.	
17	,587	,634	,412	—,165	90,6	84,1	6,1			,502	,565	,328	—,174	95,3	85,7	10,0			81,7	99,5		ssw.	sse.	se.	do	do	fresh breeze.	
18	,579	,610	,350	—,189	90,9	83,7	8,7			,443	,505	,237	—,206	96,0	84,8	12,3	at		80,3	99,5		S.	SE.	S.	do	do	do	
19	,527	,562	,314	—,207	91,0	83,8	9,0			,419	,482	,179	—,240	97,2	84,8	3,1	4pm		80,5	104,0		S.	sw.	S.	cum. str.	fine.	fine.	
20	,555	,611	,308	—,247	90,8	82,8	dry			,459	,517	,203	—,256	96,0	83,9	dry			80,0	94,0		S.	sw.	s.	clear.	cumuli.	nimbus.	
21	,618	,644	,353	—,265	90,3	83,2	9,0			,513	,566	23,860	—,673	97,0	83,6	11,3	71,5		76,7	110,2		E.	se.	s.	cumuli.	cum. strat.	hazy.	
22	,674	,714	29,136	—,558	88,2	82,8	6,0			,532	,574	,863	—,684	96,3	83,0	16,6	70,4		70,4	100,0		E.	SE.	se.	do	do	threat. nwr.	
23	,674	,719	,120	—,574	91,5	82,5	11,2			,501	,632	,018	—,543	87,1	78,7	9,2			77,2	110,0		se.	se.	NW.	do	cumuli.	fine. nwr.	
24	,631	,674	,102	—,549	88,5	81,3	9,8			,473	,532	,836	—,657	96,2	82,0	15,0			72,4	124,5	0,05	w.	W.	sw.	clear.	fine.	cir. cum. nwr.	
25	,580	,623	,039	—,561	89,6	83,3	8,6			,450	,502	,805	—,665	97,1	84,4	15,5			72,4	119,2		ne.	sw.	se.	do	do	clear.	
26	,603	,630	,057	—,566	88,9	82,9	7,3			,461	,513	,803	—,673	96,5	86,7		78,5		75,2	119,4		s.	sw.	sw.	do	do	misty.	
27	,584	,632	28,991	—,613	90,8	84,8	8,0			,474	,535	,827	—,667	95,5	84,6	10,0	78,2		81,8	100,8	0,10	sw.	sw.	se.	overcast.	cumuli.	cloudy nwr.	
28	,634	,673	29,147	—,507	85,6	78,2	6,4	73,8		,514	,553	,969	—,565	89,7	79,6	6,7	77,0		70,4	101,2	0,75	sw.	sw.	se.	do	overcast.	fine nwr.	
29	,595	,628	,083	—,532	87,5	78,9	6,5	75,2	85	,443	,479	,832	—,631	93,2	80,2	11,4	73,5	79	70,0	121,4		E.	sw.	se.	dull.	do	do	
30	,545	,580	,059	—,506	85,8	77,0	7,2	71,2	86	,422	,466	,859	—,583	91,5	79,4	9,0	74,7	81	72,3	117,4		SW.	sw.	o.	hazy.	cum. cir.	cum.	
31	,515	,558	,003	—,532	87,5	80,3	6,1	74,0		,385	,437	,795	—,600	94,9	83,9	9,4	76,0		72,0	105,0	1,00	sw.	sw.	o.	clear.	fine.	do storm.	
Mean,	29,619	,655			89,3	81,2	8,4		88	29,493	,542			99,1	84,0	14.2	75,0	74	7 6,2	110,9	1,90	Monsoon regular.			Evening squalls from 22nd.			

The new standard Barometer has stood this month, at 10 A. M. ·036 and at 4 P. M. ·049 lower than my former standard, exactly as last month, shewing that the difference of reading at the two hours is not attributable to any fault in the compensation column of the former barometer, but that it is really due to the greater sensibility of the new instrument.

The wet barometer has this month been used to ascertain the aqueous tension of sulphuric acid, up to the 21st of sp. gr. 1·83 into which it is evident that water gradually insinuated itself (see column of tensions)—and after that date of sp. gr. 1·344, which yielded an average tension of 42, that of pure water being 100.

The dew point was ascertained on the Dalton plan, with a lump of ice to cool a long thin glass of water.

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I.—*Notes on the Buddhas from Ceylonese authorities, with an attempt to fix the dates of the appearance of the last four; being those of the Mahá Bhadra Kalpa, (or Present Age.)* By *Captain* J. FORBES, *H. M. 78th Highlanders.*

1. Of the Buddhas who appeared prior to the *Mahá Bhadra Kalpa,* the names of the earliest Buddhas mentioned in Buddhist writings, are

Brahma Buddha.
Gautama Buddha*.
Tanhankara.
Medhankara.
Saranankara.

The following are the names of twenty-four Buddhas, who successively foretold the advent and exaltation of the present Gautama Buddha.

1 Deepankara,	12 Sujato,
2 Kondhanyo,	13 Piadassi,
3 Mangalo,	14 Athadassi-Atthadassi,
4 Sumano,	15 Dhammadassi,
5 Reweto,	16 Siddatto,
6 Sobhito,	17 Tisso,
7 Anomadassi,	18 Cusso,
8 Padumo,	19 Wipassi,
9 Narado,	20 Sikhi,
10 Padumutto,	21 Wissabhu.
11 Sumedo,	

Commencement of the *Mahá Bhadra Kalpa.*

22 Kakusanda,
23 Konagamma,
24 Kásyiapa.

* Not the Gautama Buddha now worshipped.

Every Buddha, on having attained the object of his ambition, not only appropriated to himself, and received from his followers the innumerable titles of former Buddhas, (many of which were appertaining to the gods,) but by visiting the same places, enjoining the same observances, retaining the same moral laws, and imitating all their actions; he identified himself with the meritorious deeds as well as with the moral doctrines of his predecessors. From these circumstances it is not easy to particularise the acts of any individual Buddha; and the difficulty has been increased by writers on this subject, who in general have preferred aimless dissertations to historical incidents.

Of KAKUSANDA,

The first Buddha in the present dispensation, B. C. 3101*.

At the commencement of this the *(Mahá Bhadra Kalpa)* most auspicious age of the world according to Buddhists, KAKUSANDA BUDDHA appeared in *Magadha*†, when KSHEMA‡ was king, and the name of the capital was Kshemawattinuwara§. He visited Ceylon, which then was known by the name of *Oja Dweepia,* and first manifested himself from Adam's peak, at that time called *Dewiyakuta,* and on the summit of which he found memorials of the religion of former Buddhas were still existing. The Mahamuvuna gardens (comprising the plain on which the most sacred edifices at Anuraadhapura are situated) was called Mahátirtiwana; and to the eastward of these was the city Abhya, the residence of a king of the same name; here also was situated the Piyal Kula mountain, (afterwards called Mehintallai) and a cave which the Buddha chose for his temporary abode.

A pestilence which had swept off multitudes, having ceased at the time of KAKUSANDA's arrival, the people, believing that it was by his miraculous interpositions, eagerly listened to the exhortations, and adopted the religion of their benefactor. The garden Mahátirtiwana having been offered to the Buddha, he sent to Kshemawatti to procure a branch of the Maharibodi tree; that it might remain as a memorial of himself, and an emblem of his religion. The tree was

* The period not of his birth or death, but of his becoming a Buddha.

† Magadha, Bahar.

‡ Kshema.

§ Kshemawatimuwara or Khemawatinuwara, probably Saewatnuwara, or Gaya; the great antiquity of which city may be inferred from the manner in which it is mentioned in the Rámáyana. In the transmigrations of Gautama Buddha, before he attained the perfection necessary for a Buddha, he is said to have been incarnate at this time as this very king KSHEMA, vide Siddhamasuma, Thupa Wanzae, &c.

sent by the king KSHEMA under charge of the priestess RUCHITANANDA and the priest MAHADEWA, and accompanied by numerous priests, priestesses, and attendants; they arrived safely, and the tree was planted by the king ABHYA according to the privilege; and with the ceremonies which had been usual on such fortunate occasions by former monarchs of the island. The place selected for the tree was near the plain Sirisamála, where the Buddha had once rested himself, and which in after times became the site of the Lowa Maha Páyá*. Having preached from where the Thupa Rama† afterwards stood, and made innumerable converts; KAKUSANDA bestowed his drinking cup as a memorial to his followers; appointed RUCHITANANDA chief over 500 priestesses, and MAHADEWA over 1000 priests, to maintain religion; then having seen the consecrated places of Ceylon, and revisited Deviya Kuta, he departed to the continent of India.

From these particulars it would not appear that the commencement of the *Mahá Bhadra Kalpa* was marked by any general revolution in the face of nature; but the commencement of an era at that time may be rationally accounted for, by the successful ministry of KAKUSANDA BUDDHA; this would also account for the same era being styled *Kali yuga* (age of vice) by the bráhmans; and *Mahá Bhadra Kalpa* (the most auspicious age) by the Buddhists.

In support of my opinion for fixing so remote a period as the commencement of the *Kali yuga* B. C. 3101, as the era of this Buddha; I have the unanimous assertion of Buddhist writers, that he appeared at the commencement of the present age, or *Mahá Bhadra Kalpa*. Sir WILLIAM JONES‡ writing on this subject says, "The best authority after all is the *Bhágawat* itself, in the first chapter of which it is expressly declared, that BUDDHA the son of JINA would appear at *Cicata*§ for the purpose of confounding the demons, just at the beginning of the *Kali yuga*." Again I quote from the same authority‖: "Bhrigu says, From this MENU named SWÁ YAMBHUVA, 'or sprung from the self-existing,' came six descendants, other MENUS, or perfectly understanding the scriptures, each giving birth to a race of his own all exalted in dignity, eminent in power—

* At Anuraadhapura. In the remains of this building are still to be seen (1600) rough stone pillars.

† At Anuraadhapura. A Dagobah and Wiharé, now in ruins; the slender, but elegant columns of which, have not inaptly been compared to the Areka tree.

‡ Sir WILLIAM JONES, Asiatic Researches, VII. 122.

§ Bahar.

‖ Sir WILLIAM JONES, Laws of Menu, Article on the Creation, Section 61.

"Swárochisha,—Auttami,—Tamasa,—Raiwata likewise, and Chácshusha beaming with glory, and Vaivaswata child of the Sun."

Chácshusha is evidently the same name as Kakusanda, the final letters being a usual honorary affix in Cingalese. He is called by BENTLEY, Cháksooso*, by WILFORD Cháshusha†, by WILSON Chákshusa‡, by COLEBROOKE Cucuch'handa§; he is also called Karkutchand‖, Prachanda Dewá¶, and Krakuchanda**; and appeared as a Menu or Muní, (which in Cingalese is a term applied to a Saint or a Buddha,) *previous* to Vaivaswata, who by many of the most eminent chronologers has been considered identical with Noah, B. C. 2984.††

The Cingalese works state that KAKUSANDA was of the race of SAMATA Rája. The first Menu, also the first king, and elected by the people, after they had lost immortality and become subject to earthly passions‡‡.

At the time of KAKUSANDA BUDDHA, Adam's peak was called Dewiyakuta, (peak of God;) when KONAGAMMA BUDDHA visited it B. C. 2100, the name was Samantkuta, (peak of Saman.) This appellation I should infer from Cingalese history it obtained from SAMAN§§, brother of RA'MA; whose era is fixed by the date of the partial submerging of Ceylon, B. C. 2387, which is three years previous to the date of the flood‖‖, and thus refers KAKUSANDA BUDDHA to a period preceding that event.

The following quotation is from TOD's Annals of Rájasthán; "Though a passage in the Agni Purán indicates that the line of Súrya, of which ICSHWACA was the head, was the first colony which entered India from Central Asia, yet we are compelled to place the Patriarch BUDDHA as his cotemporary, he being stated to have come from a distant region, and married to ELLA the sister of ICSHWACA." Referring to the era of RÁMA as already given, viz. B. C. 2387, and

* Remarks on the eras and dates of the ancient Hindus, Asiatic Res. V.

† WILFORD's Chronology of the Hindus, Asiatic Res. V.

‡ Sanscrit Dictionary.

§ COLEBROOKE's observations on the Jains, Asiatic Res. IX.

‖ Asiatic Journal, 1832, p. 380.

¶ Asiatic Journal, 1834, p. 220.

** Asiatic Journal, No. 48, p. 87.

†† Dr. LLOYD's Bible chronology.

‡‡ Jananda Pota, (Cingalese work.)

§§ SAMAN, LACKSHMANA, brother of RAMA.

‖‖ According to Dr. LLOYD's Bible chronology, Noah was born B. C. 2984, and the flood commenced when Noah had lived six hundred years, two months and seventeen days, Gen. vii. 11; or B. C. 2384.

allowing 20 years as the length of each reign of the thirty-six sovereigns from RA'MA up to ICSHWACA, would give the date B. C. 3107 as the time of ICSHWACA, and confirm the above passage regarding BUDDHA being contemporaneous with this monarch; and a similarity of sound, as well as coincidence of date, tempts me to suggest the possible identity of ICSHWACA with KSHEMA or KSHEMAKA, who is described as being the royal patron of KAKUSANDA BUDDHA*.

To explain why I have fixed the era of RA'MA, B. C. 2387. The Rájawalia states that from the time of RAWENA until the era of GAUTAMA BUDDHA (at which time a connected Cingalese history commences†) 1844 years had elapsed. In several Cingalese works‡ the partial submerging of Ceylon is mentioned as having occurred immediately after the death of RAWENA; and the consequent decrease in the circumference of the island is stated to have been 133 yoduns or 2128 miles§. It was in this visitation that the splendid capital Srí Lanká-pura (which was situated to the north-west of the present island) is said to have been overwhelmed, and

"Towers and temples through the closing wave
A glimmering ray of ancient splendour gave."

Of KONAGAMMA,

The second Buddha of the present dispensation, B. C. 2099.

At a time when long continued draught had caused scarcity and sickness in Ceylon, KONAGAMMA BUDDHA appeared‖; and seasonable rains having fallen, the consequent prosperity of the country was attributed to his power and presence. At this time the island was called Wara-dwipa, and the peak on which he, according to the custom of his predecessors, commenced his ministry in Ceylon, was

* Thupa Wansae, Buddha Wansae, Mahawansae, Saddhama Sumana, Rájawalia, Rájakatnaikara.

† Translated and arranged by Mr. TURNOUR, from B. C. 543 to A. C. 1815.

‡ Rajawalia, Kadaimpota, Lanká Wistrie. The Kadaimpota also records a similar calamity as having reduced Lanká to its present size, B. C. 267.

§ In GUTZLAFF's History of China, the following near coincidence of dates with regard to the deluge occurs. "We are now arrived at a period which CONFUCIUS himself has delineated."

"YAOU began to reign B. C. 2337." "There is an extraordinary catastrophe mentioned in the reign of YAOU, which is one of the greatest events in the history of mankind, the deluge. MANG-TZE (Mencius) in speaking of the same event, remarks, that at the time of YAOU the deluge had not yet entirely subsided. During the reign of YAOU, YU commenced the draining of the waters, and the confining of the rivers to their beds."

‖ KANAKA-MUNI, Asiatic Journal, 1834, p. 220.

called Samanta-kuta or Samanella; from thence he visited the capital Wadhamanika, situated on the south side of the Maha-Mewuna gardens*, which then bore the name of Maha-Antowana, and being acknowledged as a Buddha the king SAMURDHA dedicated to him these gardens by the name of Anopawana. At the request of the prophet, the king SOBHANA sent from the continent of India a branch of the Udambara tree, accompanied by many priests and priestesses; the whole were received with due honor, and the Udambara tree planted by the king SAMURDHA became the emblem of the new Buddha. KONAGAMMA BUDDHA (after having visited the various places consecrated by the presence of former Buddhas in Lanká) gave charge over the priestesses to the chief priestess KANAKADANTA, and over the priests having placed SUDHAMA, he bestowed his girdle as a memorial to his followers, and departed for the city of king SOBHANA.

Regarding the date which I have assigned to this Buddha, viz. B. C. 2099.

I have connected the reign of PRADYOTA king of Magadha, with the time of KONAGAMMA BUDDHA, by the various accounts of the incarnations and transmigrations of GAUTAMA BUDDHA; these all state that at the time of KONAGAMMA, GAUTAMA was incarnate as that fortunate king of Magadha, PARWATIA or PARGUYATA†; whom I consider the same as PRADYOTA of JONES and BENTLEY, PRADHYOTA of WILFORD, and PRIDOT'HANA of TOD. These authorities all agree that in the reign of that king a Buddha appeared, although they have all assigned different dates to the event. I follow that of Sir WM. JONES, who gives his authority; a quotation from the Bhagawatamrita. "He (Buddha) became visible the thousand and second year of the Kali yuga being past."

"PURANJAYA son of the twentieth king (of Magadha) was put to death by his minister, SUMACA, who placed his own son PRADYOTA, on

* At Anuraadhapura.

† Lest the father of PRADYOTA being a murderer, and himself an usurper, should be made objections against this being the king PARWATIA, in which Buddhist writers have declared that GAUTAMA BUDDHA was incarnate, I quote the life of the most revered of Buddhist sovereigns, DHARMASOKA, as it is written by Buddhist priests, and which may be thus abridged:

He commenced his career as ASOKA, a prince and a bráhman; attained power by becoming a fratricide and usurper; B. C. 323, retained it as a zealous Buddhist, and died king of India, at Patalipura, (Patna.) His memory has been extolled by all Buddhist writers, and his name and deeds are sanctified by the appellation DHARMA (the righteous) prefixed to ASOKA.

We also find, that GAUTAMA was believed to have been incarnate as SAKYA, a chief of the YAKSHAS, and as ATULA a king of the Nagas.

the throne of his master; and this revolution constitutes an epoch of the highest importance; first, because it happened, according to the Bhagawatamrita, two years exactly before BUDDHA's appearance in the same kingdom; next, because it is believed by the Hindus to have taken place 2100 B. C.; and lastly, because a regular chronology, according to the number of years in each dynasty, has been established from the accession of PRADYOTA to the subversion of the genuine Hindu government." In the Cingalese accounts we find KONAGAMMA received that protection and assistance from the king SOBHANA*, which his predecessor had received from the king KSHEMA. In the list of kings of the line of Buddha, of the Ooru or Oorvasu branch, in Colonel TOD's tables, and about the year B. C. 2050, we find the name of the king SOVAHANA; and in supposing SOBHANA and SOVAHANA identical, there is neither discrepancy of dates nor designation, for KONAGAMMA BUDDHA only *appeared* B. C. 2099, and as there is no letter *v* in Cingalese, SOVAHANA would be written SOBHANA, that being the nearest transmutation.

Of KÁSYAPA,

The third Buddha in the present dispensation, B. C. 1014.

On KASYAPA visiting Ceylon, he found it called Madá-dwipa; and the capital Wisala, situated on the west of the Mahá-Mewuna gardens, was the residence of the king JAYANTA. The people were divided into two hostile parties, the one headed by the next heir to the throne, SAMIDDHO; the other by the king's ministers: the armies had approached each other, and were only prevented from engaging by a dreadful conflict of the elements, accompanied by darkness, and succeeded by showers of fiery sparks. KASYAPA at this time descended from the peak, which was then called Subhakuta, and having succeeded in reconciling the contending parties, was acknowledged as a Buddha, and the Mah-Mewuna gardens were offered to him by the name of Sagara gardens. From Brahmadatta of the Okaká† race, king of Baranas‡, he procured a branch of the Nigródha tree, which was accompanied by numerous priests and priestesses; and was planted in the consecrated ground of Sagara, by the king JAYANTA, with the ceremonies which had been performed on such occasions by former kings. KASYAPA after converting the people, and visiting the places hallowed by the presence of former Buddhas, bestowed as a relic to his followers, the bathing cloth which he had used; then giving charge over the 500 principal priestesses to the chief of them SUDHAMMA; and over 1000 priests placing SARWAMANDA to maintain religion, he departed from the island to return to Baranas. Regard-

* SOBHANA. † Okaka, same as Ikshwaka. ‡ Benares.

ing the date which I have assigned to the commencement of KASYAPA's ministry :—

In a fragment of a poem which has the appearance of having been rendered into Cingalese from Sanscrit, called the Leechawee history, BRAHMADATTA, king of Baranas, is mentioned, and that Buddha was then residing in that city. The date is given in round numbers 2000 years after the commencement of the Kali yuga, which corresponds with B. C. 1101

Padmakarpa, a Lama of Bhotan, fixes the date,	1058
The Chinese place the birth of Buddha*,	1036
M. Bailly*,	1031
Matonan Sin, a Chinese Historian†,	1027
De Guignes, from Mongolian records*,	1027
Japanese Encyclopedia fixes his birth,	1027
Ditto ditto his death,	960
Inscription at Buddha Gya*,	1014
Mongol Chronology of Pallas,	991
Cassiano by the calculations of the Tibetians appeared‡,	959
Ditto ditto died,	950
Giorgi, death of Buddha,	959
La mort de Bouddha, ou plutot de Shakyamuni le premier de Bouddhas, est placée par un monument d'une authenticité incontestable, L'Encyclopedie Japonaise, en 950 avant notri ére§,	950

From these concurring dates, I am inclined to believe, that the death of KASYAPA BUDDHA occurred about B. C. 950, and the earlier dates given above, are either that of his birth or of his having become a Buddha.

Of GAUTAMA,

The fourth Buddha in the present dispensation—Became Buddha, B. C. 588; *died,* B. C. 543.

B. C. 543 is the era of GAUTAMA BUDDHA, and generally used in the religious and historical works of Ceylon.

It is this GAUTAMA whose moral doctrines are recognised as the rule of conduct; whose name is still invoked as the present Buddha by the Cingalese; and the existing records of whose life and ministry are so minute and credible, that they may fairly claim to be admitted into genuine history. The following are a few of the most remarkable events of his life, particularly as connected with Ceylon.

* From Sir WILLIAM JONES's Chronology of the Hindus.

† PRINSEP's Chronological Tables.

‡ WILFORD's Chronological list of the kings of Maghada.

§ Messrs. BOURNOUF et LASSEN.

Prince SIDDHARTA, the son of king SUDDHODANA, by one of his queens MÁYÁ, was born at Kapilawasta or Kumbúlwatpura, a town of Central India*; at 16 years of age he was married to the princess YASODARÁ (called also SUBHADDAKACHCHÂNA), and when 29 years of age his wife brought him a son (who was called RAHULA, and afterwards became a priest). On the same day that his son was born, SIDDHARTA forsook his family and country, and commenced a life of penance and meditation, which he continued for six years in the forest of Oorawelle; during this period existing solely by charity, and feeding on wild fruits. He fasted for 49 days, and after a severe struggle having finally overcome MARYA and his attendant host of demons†, became a Buddha by the name of GAUTAMA.

GAUTAMA BUDDHA proceeded to commence his ministry, and first expounded his doctrines at the grove called Isipatanâ in the neighbourhood of the city of Baranas. In the ninth month after he became Buddha, GAUTAMA arrived at the town of Mahâwelligam‡ the capital of the Yakshas in Ceylon, and which then covered a space twelve miles in length and eight in breadth on the banks of the Mahawelliganga. The majority of the Yakshas appear to have been converted, and to have driven those who adhered to their ancient superstitions into an island called Yakgiri. Tradition places this island to the south-east of Ceylon, and the legends which are preserved (on that coast) of sunken cities, may refer to some territory, of which the Bass rocks are all that now remain.

A portion of the hair of the Buddha was enclosed in a golden casket, over which a Dágoba was built at Myungana§ in Mahawelligam, and this relic is said to have prevented the return of the Yakshas‖ (devils) whom Buddha had expelled: i. e. the worship he had superceded.

* Madhya-désia.

† It might be translated overcame death and deadly sin; for (mára) and (mara) signifies death, destroying, lust; also a name of KAMA, god of love. CLOUGH's Cingalese Dictionary.

‡ Where Myungana now stands in Beentinne.

§ Myungana is still a sacred place of pilgrimage near the village of Beentinne; the Dágoba originally built by the chief of the converted Yakshas, was afterwards enriched by the addition of the Griwa (neck bone) relic, and enlarged to the height of twelve cubits; it was increased by the king CHULA BHYA to thirty cubits, and Dútúgaimúnú, between 164 B. C. and 140, raised it to the height of ninety cubits.

‖ The superstitions of the Yakshas had again become general in the time of PANDUKABHYA (100 years after Buddha), and continued to prevail until B. C. 307.

The second visit of GAUTAMA BUDDHA to Ceylon was B. C. 581 ; on which occasion he reconciled two rival princes of the Nágás, CHULODRA and MAHODRA, who had been carrying on a destructive war. These princes were near relations, and their capitals of Kellania* and Wadenawágalla† were situated in that part of the western coast of Ceylon which was then called Nágá-diwinia. On the termination of their feud, the throne for which they had contended, was made an offering to the Buddha, and enshrined by the Nágás in the Dágobah of Kellania‡ to be worshipped as a memorial of their teacher.

GAUTAMA BUDDHA a third time came to Ceylon B. C. 577, and having revisited Kellania, from thence proceeded to Samanella (Adam's peak), Diganakhya in Ruhunu, the eight places at Anuraadhapura, and all others which had been sanctified by former Buddhas ; then took his final departure from the island, and proceeded to his principal residence in the temple of Jaitawanarama in Saewatnuwara§ of Magadha. GAUTAMA BUDDHA continued to be indefatigable in publishing his doctrines, and to be eminently successful in increasing his followers, and at last died placidly at a short distance from the town of Kusináránuwara in Malwa, in the 81st year of his age, and B. C. 543.

Of Maitrí,

THE EXPECTED BUDDHA, WHOSE ADVENT IS FORETOLD BY BUDDHISTS.

Buddhists believe that to complete the predestined number of the Buddhas, allotted for the *Mahá Bhadra Kalpa*, and to renovate the faith of a degenerating race, MAITRI BUDDHA will be born of WIHARE DEWI, who in her last transmigration was the daughter of KELLANIA TISSA RA'JA, and who about B. C. 220 became queen of Mágam‖, and wife of KAWANTISSA RÁJA.

The emblematic tree which will be selected by MAITRI' BUDDHA, and become sacred from the time of his appearance until the end of this Kalpa, it is predicted will be the Nágaha or iron-wood tree.

* Kellania, four miles from Colomba.

† Wadenawágalla in the Swinkorles.

‡ This Dágoba still exists.

§ Buddha Gya is probably Saewatnuwara, and contains amidst its shapeless ruins the remains of GAUTAMA's residence ; as well as the wreck of those splendid temples which were built to commemorate his worth, or cover his relics.

‖ The ruins of the city of Mágam, extend over a considerable space, and include several large Dágobas ruined and overgrown with jungle ; they lie on the left bank of the Menick Ganga, and between Katragama and Hambantotti ; from the latter place to Mágam is fourteen miles.

II.—*Memoir of a Hindu Colony in Ancient Armenia.* By Johannes Avdall, *Esq.*, *M. A. S.*

A singular account of a certain colony of Hindus, that emigrated from India into Armenia, is recorded in the historical work of Zenobius, a Syrian Bishop and primate of the convent called Innaknian*, who flourished in Armenia in the beginning of the third century. The narrative was evidently written in Syriac, and intended for the Syrian nation, though the writer seems to have subsequently re-written the same in the Armenian language, but with Syrian characters; the letters of our alphabet having been invented a century posterior to that period. By a very long residence in Armenia, Zenobius was successfully enabled to acquire a perfect knowledge of the Armenian language, in which his history has been handed down to us. This interesting work was published in Venice, in the year 1832, being carefully collated with five manuscript copies, written in different periods.

I shall, in the present memoir, first give a description of this Hindu colony from the narrative of Zenobius, and then an account of the religious wars waged between them and the first propagators of Christianity in Armenia.

"This people had a most extraordinary appearance. They were black, long-haired, ugly and unpleasant to the sight. They claimed their origin from the Hindus. The story of the idols, worshipped by them in this place, is simply this: Demetr† and Keisaney‡ were brothers, and both Indian princes. They were found guilty of a plot formed against their king, Dinaskey§, who sent troops after them, with instructions either to put them to death or to banish them from the country. The felons, having narrowly escaped the pursuit, took a shelter in the dominions of the king Valarsaces, who bestowed on them the principality of the country of Taron. Here a city was founded by the emigrants, who called it Vishap or Dragon. Having

* ԻՆՆԱԿՆԵԱՆ *Innaknian*, literally meaning, nine springs or fountains, which existed in the place.

† ԴԵՄԵՏՐ Demetr is a Greek name, probably borrowed by the Hindus from the Bactrians or the descendants of the troops of Alexander the Great.

‡ ԳԻՍԱՆԵ Keisaney is derived from ԳԵԻ كيس *Keis*, which both, in Armenian and Persian, signifies a ringlet or a curling forelock. Thus we have in Richardson گیسوی عنبر آمیز locks fragrant as amber.

§ ԴԻՆԱՍԻՓԵ Dineskey is the name of the Indian king mentioned in the Armenian text, for which I have in vain searched in all old historical records and chronological tables of the dynasties of ancient India.

come to Ashtishat*, they raised idols there in the name of those they worshipped in India. Fifteen years after their settlement in the country, both of the brothers were put to death by the king, for what fault I do not know. He conferred the principality on their three sons, named KUAR, MEGHTI and HORAIN. The first built a village, and called it after his own name *Kuars*. The second founded a village on the plain, and called it after his own name *Meghti*. The third also built a village in the province of Palunies, and gave it the appellation of *Horains*.

After a certain space of time, KUAR, MEGHTI and HORAIN, of one accord, resolved on changing their abode. They sojourned on the mountain called Kárkí, which to a delightful temperature added a fine and picturesque appearance. It abounded in game, herbs, wood, and all that is adapted for the comfort and convenience of man. Here they raised edifices, where they set up two idols, respectively dedicated to KEISANEY and DEMETR, in honor of whom attendants were appointed out of their own race. KEISANEY had long flowing hairs, in imitation of which his priests allowed the hairs of their heads to grow, which custom was afterwards prohibited by authority. This class of people, on being converted to Christianity, were not deeply rooted in their faith. They durst not, however, openly profess the religion of their pagan ancestors. They continued, therefore, dissemblingly to allow their children to wear plaited hairs on the crown of their heads, in remembrance of their idolatrous abominations."

The description of this idolatrous colony is entirely accordant with the colour, appearance, manners and religion of the present Hindus. The cause of their emigration from India is distinctly stated by ZENOBIUS, but through what route or in what period they found their way into Armenia, it is very difficult to determine. It is, however, clearly evident that they had formed a permanent settlement in our country prior to the commencement of the Christian era. VALARSACES, under whose government they found protection, was grandson of ARSACES, the Parthian, and brother of ARSACES the Great, by whom he was appointed king over Armenia, *Anno Mundi* 3852, or a century and a half before Christ. I shall now proceed to give a translation of ZENOBIUS's narrative of the religious wars of this Hindu people with the first Christian converts of Armenia.

* ԱՇՏԻՇԱՏ *Ashtishat* was a city in Armenia Major. It was so called from ԱՇ *sacrifice*, and ՇԱՏ *many*; for innumerable sacrifices were offered there to the gods and goddesses of Armenia. It might, perhaps, be well compared to Jagannáth or Káli Ghát of this country.

"Having taken our departure from Thordan, we intended to proceed to Carin and Harc. St. Gregory was informed by some of the princes of the existence of two idolatrous temples in the province of Taron, the inhabitants of which offered sacrifices to the devil. Hereupon, our course was changed to the place where these temples stood, with a view to effect their demolition. Having arrived in the country of Palunies, in the extensive village called Keisaney, near the town of Kuars, we met there some of the heathen priests. Having ascertained from the prince of Hashtens that on the following day the great images of Keisaney and Demetr were to be levelled to the ground, they repaired to the temples in the dead of the night, and removed from thence all the treasure into subterraneous places. Intimation of the impending danger was forthwith sent to the heathen priests in Ashtishat, who were earnestly urged to collect warriors, and quietly join them on the morrow in order to take an active part in the battle, which was to be fought by the great Keisaney with the apostate princes. In like manner the inhabitants of Kuars were also instigated to lie in ambush in the hedges of gardens, and ruffians were sent to waylay the Christians in the forests. The head priest, called Arzan*, and his son Demetr, took the command of the troops stationed at Kuarstan, and halted there, awaiting the arrival of reinforcements from other quarters. On the following day they made a descent to the skirts of the mountain, in order to indulge in marauding and pillage.

"St. Gregory, accompanied by the prince of Arzruniest, the prince of Anzevazies, and the prince of the house of Angl‡, and followed by a small number of troops amounting to about three hundred, ascended the mountain in the third§ hour of the day, where Arzan lay in ambush. They had not the least knowledge of the position of the enemy, and never expected to meet him there. On a near approach to

* ԱՐՁԱՆ *Arzan*, literally means in Armenian, statue, image or idol.

† ԱՐԾՐՈՒՆԻՔ *Arzrunies* was the title of a satrapy in Armenia, and signifies *eagle-bearers*. The Satraps known by this appellation, used to carry eagles before the Arsacian king Valarsaces and his successors.

‡ ԱՆԳԵՂՏՈՒՆ *Angltún*, the genitive of which is ԱՆԳԵՂՏԱՆ *Angltan*, means the house of *Angl* ԱՆԳՂ or vulture. This was a title of distinction, conferred on a noble family in Armenia, compared to that bird of prey, on account of the ugliness and deformity of their features.

§ This is to be understood according to the mode of the computation of time, obtaining in eastern countries. The hour mentioned here, corresponds with nine o'clock in the morning. Thus we have in the Acts: "For these are not drunken, as ye suppose, seeing it is *but* the third hour of the day."

the acclivity of the mountain, ARZAN and DEMETR rushed out from the ambuscade, and on a signal being given, the trumpets of war were sounded, and a furious attack was instantly commenced. This was enough to alarm the Christian princes, whose horses took fright from the sound of the trumpets, and began to neigh and plunge, and create the greatest confusion. Hereupon, the prince of the house of Angl raised his voice and cried, 'Prince of the Seunies, step forward and see whether these are the troops of the prince of the north.' The necessary inquiries were made, but no satisfactory information was obtained. The prince of the Seunies returned and insisted on the removal of St. GREGORY and his companions to a secure place, lest, he feared, they might be made prisoners by the enemy, which event would surely excite the anger of the king, and bring the Christian princes into disgrace. 'Send then,' added he, 'a trusty person to recall our troops, for the number of the enemy is alarmingly great, and innumerable flags are seen waving in the air.'

"No sooner was the warning given, than the prince of the house of Angl, gave charge of St. GREGORY to the prince of the Mocks, with instructions to convey him to the castle of Olkan, and there to await the issue of the battle. Information of this was immediately sent to the troops. The prince of the Mocks, accompanied by St. GREGORY, descended the declivity of the mountain, wishing to repair to Kuars. They met with great resistance on the way from a party of the enemy, but by the help of Providence, at last succeeded in effecting their escape. We were, however, pursued by a number of villagers, but being mounted on swift horses, took refuge in the castle of Olkan, where we met with a timely assistance and protection. The villagers having proceeded to the town of Kuars, informed its people of the place of our retreat. The castle of Olkan was, therefore, instantly besieged. We were thus seized with apprehensions for our safety, and forthwith dispatched a messenger with letters to the prince of the house of Angl, conveying him information of the perilous situation in which we were then placed. He immediately sent us four thousand troops, all selected from the army, and furnished with swords, who crossed the river and reached their destination on the following day. After a siege of three days, they took possession of the town of Kuars, and reduced its walls to ruins, and razed all its houses to the ground. The people of the place, that had escaped the stroke of the sword, were conducted to Meghti.

"The Christian princes being apprised of this, ascended the mountain, and descried ARZAN in ambuscade with four hundred men, more or less. They immediately made a sortie on the enemy, and put

Arzan to flight. The Armenian troops having heard the din of battle, immediately crowded to the mountain. Upon this, Arzan began to rally, and heap on the Armenian princes torrents of abuse. 'Step forward, said he, 'ye base apostates, who disbelieve the gods of your ancestors, and are opposed to the glorious Keisaney. Do you not know that it is Keisaney that wages war with you this day, and will subdue you under our hands, and inflict you with blindness and death?' The prince of Arzrunies, having rushed forward, said, 'Thou worthless bully, if you fight on behalf of your gods, you deceive yourselves; if you fight on behalf of your country, you only display your own folly. Behold the prince of the house of Angl, and the prince of the house of Seunies, and the other nobles, whom you know too well.' To which Demetr, the son of Arzan, thus replied: 'Listen unto us, ye Armenian princes! it is now nearly forty years since we are engaged in the service of the mighty gods. We have an experience of their powers, and are assured that they fight with the enemies of their servants. We are not, however, able to cope with you in battle. This is the habitation of the king of Armenia, and ye are his nobles. But, be it known to you all, that though it is out of our power to conquer you, yet we prefer to die a glorious death to-day in upholding the honor of our gods, than to live and see their temples polluted by you. Death is, therefore, more welcome to us than life.' Having spoken this, Demetr challenged the prince of the house of Angl to a single battle.

"The prince of the house of Angl having accepted the challenge, made an instantaneous attack on Arzan, who inflicted a wound with his spear on one of the thighs of his antagonist, and was on the point of levelling him to the ground. The prince of the house of Angl having, by an adroit movement, regained his position, thus addressed the enemy: 'Know thou this, Arzan! that this spot must receive the appellation, by which you are called; for here thou art destined to fall, and be fixed like a statue!' No sooner was this spoken, than he lifted up his arm, and aimed a stroke of his sword on his right shoulder, by which his head, together with his left shoulder and leg, was instantly severed from the body. Thus fell Arzan, and was fixed like a statue on the ground. He was buried on the very spot, which to this day is called, after his name, *Arzan*.

"Hereupon the heathen army was immediately swelled by re-inforcements sent by the priests from the city of Vishap. The people of Partukh, and Meghti and Astaghon, also crowded to the spot of battle,

and the number of the army was thus increased to five thousand four hundred and fifty.

" Their arrival in the summit of the mountain, created great noise and confusion in the ranks of the two armies. The heathen priests made a simultaneous attack on the Armenian troops, and by a vigorous pursuit after them made them descend the declivity of the mountain and fly towards the village. The villagers, who lay in ambush, having encountered our troops, stopped their progress, and these being thus hemmed in on both sides, were put to the sword. But the prince of the house of Angl having passed through the ranks of the heathen priests, directed his course towards the mountain, where several men were kept in reserve, and caused great mischief by flinging stones at our horses. DEMETR having observed the prince of the house of Angl ascend the mountain, left the rest below and pursued his steps. He was immediately followed by his troops, all mounted on horses.

" The battle was resumed on the top of the mountain. Our army waited in expectation of further re-inforcements. The whole of our troops had not yet assembled on the spot, of whom four thousand remained in charge of the prisoners in Meghti, and three thousand proceeded to Basain and Harc. The rest were given to pillage and marauding in the field. Ere decisive blows were exchanged, the approach of night put a stop to further operations. Both armies were, therefore, obliged to encamp on the spot and wait the dawn of the morn. On the following day the expected Armenian troops made their appearance; and a re-inforcement of about five hundred men, from the city of Tirakatar, came to the assistance of the heathen priests. The number of both armies were swelled in this manner. The heathens amounted to six thousand nine hundred and forty-six men, while the Armenians were only five thousand and eighty in all. The trumpets were sounded, and the battle commenced on both sides. In the beginning the Armenians proved victorious over the heathens. But the prince of Hashtens, formerly attached to the party of DEMETR, but now commanding the Armenian army, deserted his post, and joined the ranks of the heathen priests with seven hundred men. The Armenians met with a formidable antagonist in this deserter. Our troops were seized with fear and dismay at the desertion of this brave warrior, whose superiority in military operations was generally acknowledged, and whose extraordinary prowess had rendered him an object of respect and admiration with all the Armenian princes. The rebel attacked our army with the greatest fury, and was flushed with the success of his arms. Hereupon the prince of the Seunies

cried to him in a contemptuous voice, 'Thou whelp of a wolf* ! thou beganst to display the disposition of thy father, and feel a delight in feasting upon carrion.' The rebel replied in a bold and reproachful manner, 'Thou vainglorious eagle† ! thou only piquest thyself on the power of thy wings; but if thou ever fallest in one of my traps, thou shalt soon feel the weight of my arms.' The prince of the Seunies could not brook this taunt, but furiously rushing on him, directed the axe which he held in his hand to his helmet, and having driven him to some distance from his troops, pursued him to the eastward of the mountain. Here, opposite to the convent of Innaknian, he brought him to the ground by a violent shove from the horse; and having himself alighted, instantly severed his head from the body, which he precipitated headlong from the mountain. 'Now,' said he, 'let vultures behold you, and know that the eagle has killed the hare.' Immediately after this, the prince of the Seunies returned to the army; and the place where the prince of Hashtens fell, is to this day called by the appellation of the *Eagles*.

"The Armenians were emboldened by this success, and the prince of Arzrunies attacked the head priest of Ashtishat, called METAKES, whom he dragged to the summit of the mountain, commanding a view of the battle. METAKES here made a violent resistance, and inflicted a wound on one of the thighs of his pursuer. The latter, burning with rage and a spirit of revenge, levelled a stroke of his scymetar on his neck, which he cut off from the body. He threw down the headless trunk, and the spot where the deed was committed, received the appellation of *Metsakol*.

"The prince of ‡ Arges seeing this, consulted his safety in flight, and secured himself in a place of concealment. The prince of Arzrunies, seemingly not noticing this, gently approached the fugitive, and made a sudden and unexpected attack on him. The wretch fled into the forest, where the sharp point of one of the branches of a tree, having passed through his breast, hastened his fall and dissolution. The conqueror returned with the horse of the dead, and the spot was called the vale of *Arges*.

"Immediately after his return he found DEMETR and the prince of

* ԳԱՅԼԱԿՈՐԻՆ *Gailakoreún*, literally, means a young wolf, or the cub of a wolf.

† Ա՛Յ ԱՐԾՈՒՈՑ ՁԱԳ is an abusive mode of expression in Armenian, similar to that of Ա՛Յ ՀԱՆ ՁԱԳ *thou son of a dog*.

‡ ԻՇԽԱՆՆ ԱՐՔՈՒՑ *Prince of Arges* was another title of nobility in Armenia, literally signifying the *prince of the bears*.

the house of Angl wrestling together with the greatest fury. Having made a violent rush, he chopped off the right shoulder of the former, and threw it on the ground. The severed head he carried away in his knapsack. The victorious Armenians put the heathen army to the sword, and the number of the killed amounted to one thousand and thirty-eight. The rest were made prisoners, and stripped of all they were possessed of. The son of the prince of the Mocks fell in the battle by the hand of DEMETR, and this melancholy event spread universal sorrow among the Armenian troops.

"The fall of DEMETR was made a signal of cessation from slaughter, and the trumpet of peace was sounded by order of the prince of the Seunies. The two armies immediately desisted from the continuance of carnage. The surviving heathen priests gladly availed themselves of the occasion, by soliciting the Armenian princes to sanction the interment of their dead. Their request was readily granted. The killed on both sides were collected in heaps, and buried in pits dug for the purpose. Monuments were raised on their graves, bearing the following inscription, in Syrian, Hellenic, and Ismaelitish characters.

ԱՌԱՋԻՆ ՊԱՏԵՐԱԶՄ ՈՐ ԵՂԵՒ ՅՈՅԺ ՍԱՍՏԻԿ
ՊԱՏԵՐԱԶՄԻՆ ԳԼԽԱՒՈՐ ԱՐՋԱՆ ՔՐՄԱՊԵՏՆ
ՈՐ ԿԱՑ ԱՅՍՐ Ի ԹԱՂՄԱՆ
ԵՒ ԸՆԴ ՆՄԱ ԱՐՈ ՀԱԶԱՐ ԵՐԵՍՈՒՆ ԵՒ ՈՒԹ
ԵՒ ԶԱՅՍ ՊԱՏԵՐԱԶՄ ԱՐԱՐԱՔ ՎԱՒՆ ԳԻՍԱՆԵԱՅ ԿՈՒՈՑ
ԵՒ ՎԱՍՆ ՔՐԻՍՏՈՍԻ։

"THE FIRST BATTLE FOUGHT VERY FIERCELY,
THE CHIEF COMMANDER IN THE BATTLE WAS ARZAN THE HEAD PRIEST,
WHO LIES HERE INTERRED,
AND WITH HIM ONE THOUSAND AND THIRTY-EIGHT MEN.
WE WAGED THIS WAR FOR THE IDOL KEISANEY
AND ON BEHALF OF CHRIST."

Here concludes the narrative of the religious war. Our historian, it appears, was an eye-witness to the scene he describes. This victory was celebrated by the Armenians with the greatest pomp and merriment. The heathen temples were razed to the ground, and the images of KEISANEY and DEMETR were broken to pieces. They were both made of brass. The length of the former was fifteen feet, and that of the latter twelve feet. The priests of the idols, with tears in their eyes, intreated the victors to put themselves to death, rather than destroy their mighty KEISANEY. Six of the priests were killed on the spot, for the resistance they offered to the Armenians. On the restoration of peace, the prince of the Seunies proceeded

to the village of Kuars, and succeeded in persuading its inhabitants to forsake idolatry and embrace the Christian religion. Being duly prepared for baptism, they were conducted to the valley of Ayzasan, where they were baptised by St. Gregory, and thus admitted into the fellowship of the Church of Christ. "The number of persons," says Zenobius, "christened on the first of Navasard*, including men and children, amounted to five thousand and fifty." Females, it appears, were excluded from this number, and baptised on another day, appointed for the occasion. Some of the heathen priests and their families, however, tenaciously adhered to the idolatrous practices of their forefathers. The paternal persuasions of St. Gregory had no effect upon their minds. "Remember this well," said they to the Armenian princes, "that if we live, we will make you a recompense for your treatment; but, if we die, the gods will wreck their vengeance on you all on our behalf!" Hereupon the prince of the house of Angl ordered them to be taken to the city of Phaitacaran†, where they were imprisoned and their heads shaved. The number of these prisoners amounted to four hundred.

It is impossible to know what was the number of this Hindu colony at the time of their emigration from India into Armenia. We are, however, certain, that from the date of their first settlement in the Armenian province of Taron to the day of the memorable battle, a period of about four hundred and fifty years, they must have considerably increased and multiplied, and thus formed a part of the population of the country. No vestiges of this Hindu race can, at present, be traced in Armenia, save the record of their exploits, handed down to us in the narrative of Zenobius‡.

* ՆԱՒԱՍԱՐԴ *Navasard* is one of the ancient Armenian months, corresponding with the month of August. An account of these months is given by M. Brosset in the *Nouveau Journal Asiatique* for December 1832, page 526.

† ՓԱՑՏԱԿԱՐԱՆ *Phaitacaran* was the capital of an extensive province of that name, where Sanatruk, the great Armenian Satrap, proclaimed himself king immediately after the death of Tiridates. It is situated on the confluence of the rivers Araxes and Kur.

‡ Our historian was also called by the appellation of ԳԼԱԿ *Glak*, whom St. Gregory appointed primate of the convent of ԻՆՆԱԿՆԵԱՆ Innaknian, which afterwards received the appellation of ԳԼԱԿ *Glak*.

III.—*Facsimiles of various Ancient Inscriptions.*

Fearing that many of the inscriptions with copies of which I have been favored by my mofussil correspondents, may be mislaid or lost sight of unless committed to print, I am led to anticipate the full explanation which many of them doubtless might receive from those who have learning, industry, and will, to decypher them, but want the necessary leisure at present to undertake the task,—by transferring them to the stone at once, and recording them in the Journal along with the notes that accompanied them, where they may be at all times available when accidental discovery may open a clue to their interpretation. Some indeed are of a promising nature, and have been in a great measure made out, while others have been alluded to in former Nos. of the Journal or in the proceedings of the Society, to which reference alone is all that can be offered. I must proceed in the inverse order of the plates, having numbered them without consideration.

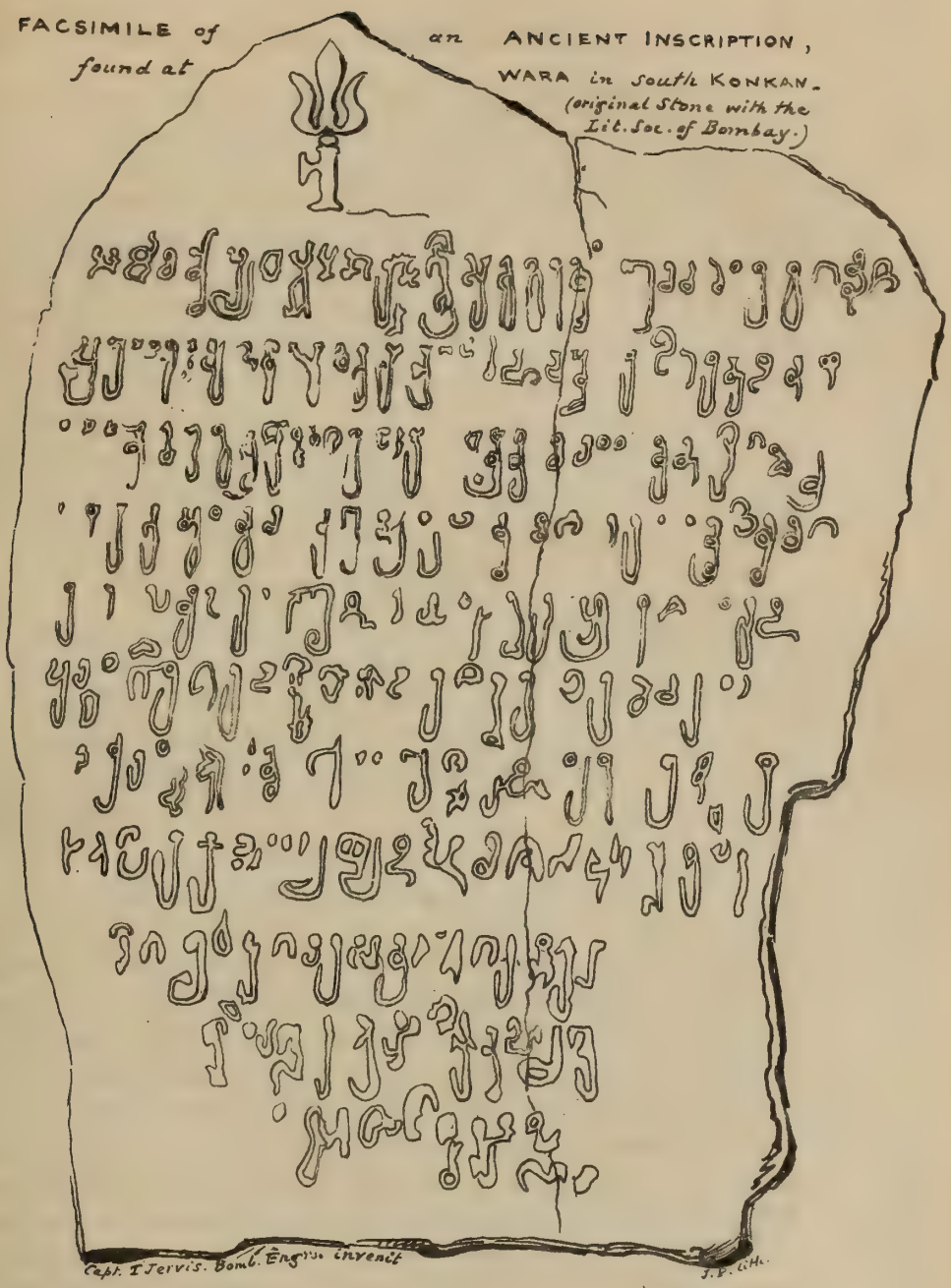
Konkan Inscription.

No. I. of Plate X. is the reduced *facsimile* of an inscription on a slab of stone from *Wara* in South Konkan, presented to the Bombay Literary Society by Captain T. JERVIS, of the Engineers, by whom it was supposed to be in the *Cufic* character. It was communicated to the Bengal Society by our associate the Rev. Mr. BATEMAN, in January, (see p. 58.)

Those who have noticed the series of ancient Hindu coins depicted in the November and December Nos. of the Journal of last year, will doubtless recognize in the present inscription the peculiar form of the Nágarí character on the Saurashtra group of coins. The *trisul* surmounting the inscription would indeed have been sufficient to negative the possibility of its Cufic origin. From the position of this symbol, which we must suppose to have been in the centre of the slab, it is probable that a third of the inscription on the left hand is broken off, which alone would prevent the possibility of coming at the purport of it. This is a pity on more than one account; for the initial invocation might have afforded a clue to a few of the letters, to the language, and to the sect of Hindus that erected the monument; although the latter may be considered to be sufficiently established by the symbol of Siva surmounting the legend.

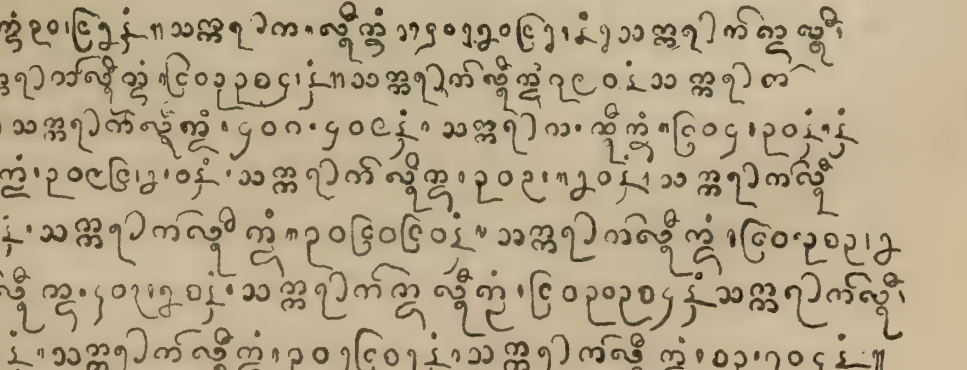
The chief peculiarity of this form of alphabet is, that the tails of the letters are lengthened and turned up backwards in a loop. Abstracting this portion, the essential part of the letter resembles the Gujerátí type of Mr. WATHEN's inscriptions, (See vol. iv. p. 477.) The vowels also belong to the same type: the *y* is subjoined to the *s* and other

FACSIMILE of an ANCIENT INSCRIPTION, found at WARA in South KONKAN.
(original Stone with the Lit. Soc. of Bombay.)



Capt. T. Jervis. Bomb. Engrs. invenit. J. P. Lith.

Inscription at the Damatha Cavern, near Maulamyeng (Moulmien)



Mr. Roley J. Prinsep lith.

consonants in the same manner; and, in short, there can be little doubt that both are of one family, and that the monuments bearing these characters may boast of as high an antiquity as has been allowed to the coins, (Pl. XLIX. vol. iv. page 684,) of the Saurashtra group. Some of these, it will be remembered, have a trilingual symbol, in common with the oldest form of coins dug up near Seháranpur; and the head on their obverse is supposed to be imitated from the Greek coins of Kodos, probably a Parthian successor of some of the petty Greek chieftains on the Indus. Other coins have a trident on the reverse.

In the first and third lines there appear to be numerals, which may be read ১১১০ and ১১০০, 1110 and 1100: the figure *one* being rather like the Bengálí than the Nágarí form. These however can hardly refer in any known era to the period assigned to the coins.

Moulmein Inscription.

No. II. of the same plate, is the inscription in the *Barma* character and *Talaïn* language found in the Damatha Cavern near Moulmein by Captain W. Foley, and mentioned in his paper, (page 274 of the preceding No.) I have appended a translation by Ratna Paula in a postscript to the same paper, but nothing can be made of such an enigmatical jumble of figures.

Chunar Inscription.

No. I. of Plate IX. is taken from a pencil sketch of a stone slab in the Fort of Chunar near Benares, by Lieut. A. Cunningham, Engineers.

This young officer, who during his short residence at Benares has brought so many facts and antiquities to light as to make me blush for my own inactive residence there, had some time previously sent me a Nágarí transcript of the same inscription, in its present mutilated condition, written out by a Benares pandit, who also supplied the missing part of the text from a copy taken, he asserted, some years ago, before the surface of the stone had peeled away. An imperfect copy of the same, as it formerly existed, was also found among the Fort Adjutant's records at Chunar. On comparing the three, however, many discrepancies were perceived, and the position of the erasures was not marked in the pandit's transcript. I therefore again wrote to Lieut. Cunningham, who proceeded to the fort and took the copy himself from the stone, whence the present lithograph is made.

Having such abundant materials for making out what appeared a most simple inscription, I entrusted the whole to a young pandit, late of the English class in the Sanscrit College, to put together and translate. He made several alterations in the Benares pandit's readings,

and substituted what he considered would better fill up the gaps; the sense was, however, so completely jumbled by these *amendments*, that I was loth to trust the translation to print without first troubling our learned Vice-President, the Rev. Dr. MILL, to look it over: and it was fortunate I did so, as will be seen by the comment his valuable notes afford on the attempt of the Benares pandit! As for the Bengáli's version, it was so much worse as to be unworthy of notice.

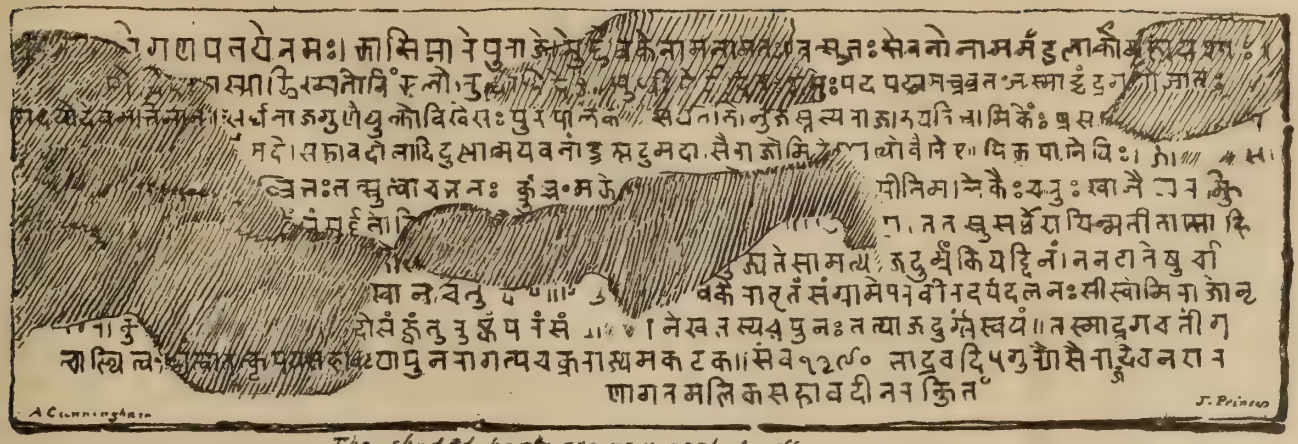
I had first imagined that the SHAHAB UD-DIN, whose invasion and assault brings upon him the epithet of दुष्टात्मा (the wicked-minded and tyrannical *Yavana,)* must be the first Patán sovereign of that name, whose overthrow of Rája BANÁR of Benares in 1193, A. D., is circumstantially recorded in FERISHTA. The date, however, which corresponds with Thursday, the 5th August, 1333, A. D., falls in the reign of MUHAMMED SHAH; and Dr. MILL has succeeded in discovering the actual owner of the title *Shahab ud-din* referred to.

The inscription has some interest in a historical view, as supplying the names of three successive rájas of Benares in the 13th century, of which no clue is to be obtained from other sources. Neither local tradition nor history supply any information regarding the holy city subsequent to the overthrow of the fort by CUTB UD-DIN, until a cursory notice of it occurs as the site of an encampment, in BABER's Memoirs.

Dr. MILL's restoration of the text is as follows, placing the interpolations in smaller type. I have inserted his notes on the pandit's version, as affording an useful example of the caution necessary in such cases, and proving how utterly void of trust are the attempts of the pandits of the present day, unless they have to deal with one capable of understanding what they would foist upon the unsuspicious as faithful transcript and good sense.

Line on the stone.	Verse.	
		* ओं गणपतये नमः।
1	I	काशिपारे पुरा योऽभूद्देवको नाम नामतः।
		तत्सुतः सेवनो नाम मण्डलार्को महायशाः॥
2	II.*	सोऽधिपो यस्मादिख्यातो विशालो भुवनाधिपैः।
		सुधीभिर्वेष्टितः प्रभोः पदपद्ममधुव्रतः॥
3	III.	तस्माच्चन्द्रगणो जातः *सदयो देवभक्तिमान्।
		सर्व्वराजगुणैर्युक्तो विश्वेशः पुरपालकः॥
	IV.	खामिराजोऽनुजस्तस्य राजा जयति धार्म्मिकः।
4		प्रस[न्नः सर्व्वभूतान]ां* [शासनज्ञः सतां]मुदे॥
	V.	सहाब्दीनादिदुष्टात्मयवनेन्द्रमहम्मदा।

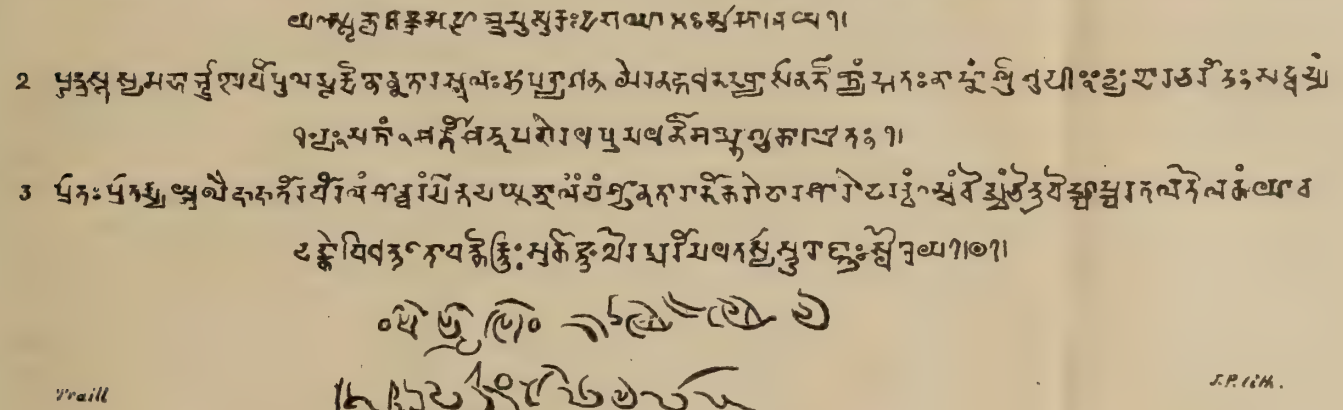
1. INSCRIPTION FROM THE FORT AT CHUNAR. 1836.



A. Cunningham J. Prinsep

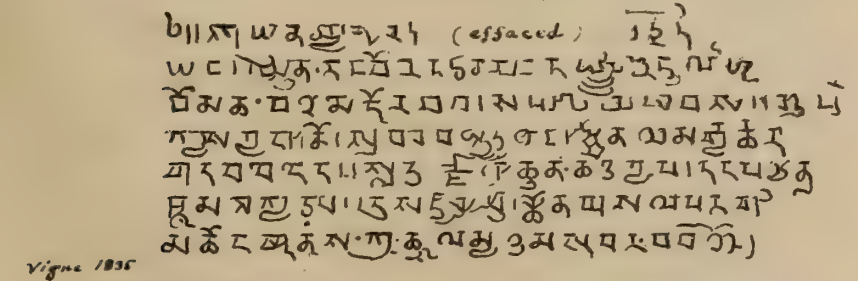
The shaded parts are now peeled off

2. INSCRIPTION FROM BÁRAHÁT IN GARHWAL



Traill J.P. lith.

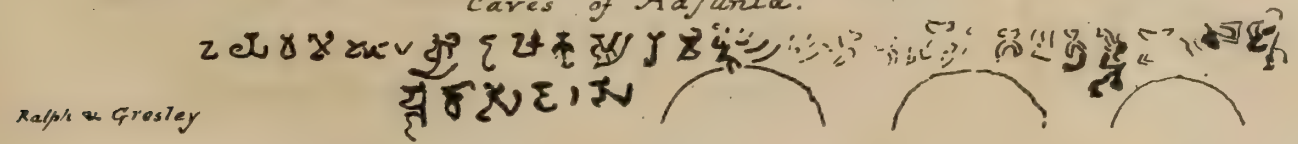
3. *Inscription on a Granite-rock near Iskardo, in Little Tibet. under a bas-relief of Buddha.*



Vigne 1835

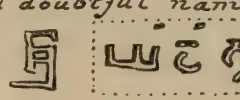
(Two other inscriptions taken by Mr Vigne, also in the Tibetan character, are too much mutilated to be transcribed.)

4. *Inscription on the entrance of a chamber containing an image of Buddha, in the Caves of Adjunta.*



Ralph & Gresley

5. *Facsimile of a doubtful name in the Bihtarí Inscription. (see Pl. VIII.)*



A Cunningham J. Prinsep lith.

सैराजो मि[लितोऽम]त्यो वैरिणापि कृपानिधिः ॥

5 VI. गंगारोधसि*[तेनैव नुन्ना सेनांपरो]र्व्वितः ।
तत् श्रुत्वा च ततः क्रुद्धमजे [यारिमवेन्नृपः ॥

VII. ऋतः खं] पीतिभिर्लोकैः चेरुः खानै [ष]रक्षि[तुं ।

6 *खामिराजादयो दुर्गं वीराः] संमर्द्दतो द्वि[षां ॥]

VIII. ततस्तु सर्व्वे श्रथिनोऽतीतास्ता द्वि[*भयोर्भयः ।

7 यवनानां तदा सेना तद्दुर्गं प्राविशच्छलात् ॥

IX. यस्मान्न]युज्यते सामात्यजद्दुर्गं कियद्दिनं ।

8 ननु दानेषु वैरि[*भ्यो दत्तेष्वपि यथोचितं ॥

X. भूयः]स्थानवितुं [प्रस्थ्य तु रथं स स्था]वकैरावृतं
संग्रामे परवीरदर्पदलनः श्रीस्वामिराजोन्द[पः ।

9 *स्वाक्रान्तारमवेक्ष्य हन्त शत]दोस्संज्ञं तुरुष्कं परं
संग्र[ामागम]नेखलस्य च पुनः तत्याज दुर्गं स्वयं ॥

10 XI. तस्माद्भगवतीं ग*त्वा स्थित्वा मत्वा च तत्कृपां ।
ईहया पुनरागत्य चक्रे राज्यमकंटकं ॥
संवत् १३९० भाद्रपदि ५ गुरौ सैराजदेवनश्र

11 *णागतमलिकसहाबदीनरक्षितं ॥

Translation.

Om! Salutation to GANAPATI.

I. Of him who under the name of DE'VACA, reigned on the opposite coast to Kási (Benares), the son called SEVANA was as the sun in the firmament, greatly renowned.

II. That king being celebrated as illustrious by the sovereigns of the world, was ever surrounded by sages, ever devoted to SAMBHU [or SIVA], as the bee to the lotus.

III. Of him was CHANDRAGANA born, merciful, devout to the gods, endued with all kingly virtues, lord of all, guardian of the city, (Benares).

IV. His younger brother SVÁMI RÁJA excels as a religious king, gracious to all creatures, and skilfully exercising government, to the delight of good men.

V. By MUHAMMED*, lord of the hostile Yavanas [Moghals]

* This was MUHAMMED SHA'H, the third Emperor of Dehli of that name, who succeeded his father TUGHLEC SHA'H GHAYASH UD-DÍN, A. H. 725—eight years before the date of this inscription—celebrated for his frantic expedition to the

SHAHAB UD-DIN* and the rest, though an enemy, was SAIRÁJA†, the treasure of benignity, employed as prime minister.

VI. (By him) from a (far) country (was an army sent to the bank of the) Ganges. (The king) on hearing of this, (believed) that an angry and invincible (enemy was approaching.)

VII. Upon this (SVÁMI RÁJA and other brave men), went with horses and men, and sound (of arms, &c.) to defend from the assaults of the (foe, their fort) [Chunar.]

VIII. Then did all the inhabitants sleep secure, for those (waves of terror) had passed by: (and then the army of YAVANAS entered their fort by surprise or stratagem.)

IX. And since pacification‡ was not expedient, he [SVÁMI RÁJA]

Chinese border, his attempt to remove the seat of empire from Dehli to Doulatábád, his application for investiture from the Khaliph of Mecca, and many extravagancies which caused his sanity to be suspected. [The name Yavana, as is well known, is generally applied by the Brahmins to their Mahometan conquerors; though arising from a misconception of the term as occurring in their own ancient books, where it undoubtedly refers to the Greeks, whom Persians, Phœnicians and Hebrews always designated by the same name.]

* The SHAHAB UD-DIN here meant is not the emperor OMAR SHAHAB UD-DIN, who succeeded his father ALA UD-DIN, A. H. 716, and was murdered after a short reign of three months; but must be one to whom, as FERISHTA tells us, MUHAMMED SHA'H gave the title of MALIC (by which he is called at the close of this inscription) and a place called Nusarí as a jaghir. FERISHTA's words are وملك شهاب‌الدين را ملك افتخار خوانده نوساري را بجاگيرش مقرر كرد Further on in the life of the same Emperor MAHAMMED IBN TUGHLEK, and nine years after the date of our inscription, that at the close of a successful expedition to the Dekhan he gave to Sultan SHAHAB, who is most probably the same person, the title of NASARET KHA'N, and the government of Baider on the Indus, yielding annually the revenue of a crore of rupees وشهاب سلطان را نصرتخان خطاب‌داده ولايت بيدر حواله او نمود و اقطعات آن نواحي را بصدلك تنكه مقاطعه باو داده All this is confirmatory of what is apparent from the inscription, viz. that this SHAHA'B UD-DIN was the general of the army which MUHAMMED SHA'H or his Hindu minister sent against the Rája of Benares.

[A celebrated Cazi named SHAHAB UD-DIN is commemorated by ABUL FAZL, who was flourishing at the time of TIMUR's invasion at the close of the 14th century. But this is somewhat too late.]

† This SAIRA'JA I do not find mentioned by any historian of the time.

‡ The allusion is here to the several modes of dealing with an enemy enumerated in MENU VII. 198, viz. सामन् *pacification*, दान *presents* भेद *sowing dissensions*; either of which three the Hindu legislator prefers in respect of

abandoned the fort for some days; only (presents) having been given (to the enemy, according to usage.)

X. (But once more) to protect his own people did the noble king SVÁMI RÁJA, the crusher of the pride of alien heroes in fight, (ascend his chariot)* surrounded by applauding heralds: but (having perceived) the great Turkish warrior surnamed (SATA) DOS [or him of the hundred arms], at the approach of the hateful one in battle, he again left the fort of his own accord.

XI. Thence having approached *Bhagavati* [the goddess ANNA PURNA DEVI at her city Benares,] having abode there, and meditated on her benevolence, thence returning with care, he established his kingdom here free from all thorns of trouble.

Samvat 1390, in the month Bhadra, fifth day of the waning moon, [Aug. 5, O. S. A. D. 1333,] on Thursday, was the kingdom set free from MALIC SHAHÁB UD-DIN, acting under the protecting favor of SAIRÂJA DEVA aforesaid.

REMARKS ON THE SANSCRIT TEXT.

Verse I. The Benares Pandit's reading काशीस्थानेषु राजा is much worse in sense, beside being inconsistent with the evident letters of the inscription, which are as exhibited above. The यो is required in Sanscrit construction by the तत् of the next line.

II. The B. P.'s reading सोऽधिपः स च विख्यातो विश्रुता वसुधाधिपैः though somewhat smoother in metre, is inferior in every other respect to this, which (except for the indistinctness of the रा in विसाहो and of the syllables वनाधि is clearly marked on the stone.

In the second half, the B. P.'s reading श्रम्भुपाद् is inconsistent with the characters on the stone.

III. In the last quarter of this verse, I wish I could read with the B. P. विश्वेशपुरपालकः in one compound; Visvésa-pura being a well-known name of Benares.—But the *visarga* is too clear on the stone to admit of that reading.

IV. In the second half of this verse only the beginning प्रस and the end मुद्दे with the exception of an ा in the middle, is clearly legible. My conjectural reading of the rest in small characters is accommodated to this—whereas the B.

prudence, to the fourth युद्धं *giving battle;* and our prince SVA'MI RA'JA seems to have been of the same mind. The meaning here is however that to the first, *pacification*, he preferred the second, of buying off the enemy. If for ननु we read नतु, it would mean that he abstained from both of these methods: if we read नाना, it would mean, on the contrary, that he was profuse in his presents while he abstained from making peace. The first seems to me the best reading of the three: and all of them more probable than नूनं which is the reading of the Benares pandit.

* I find no Moghul or Afghan warrior to whom this name can be considered as necessarily applying. The syllable श्रत् sata is conjecturely supplied to fill a hiatus on the stone.—W. H. M.

P.'s सुयशाः शास्ति दुर्गेऽस्मिन्परा प्रवणमानसः is *altogether* gratuitous and irreconcilable with the yet remaining letters of the verse.

V. The B. P.'s reading of this verse:

सहाबुदीनदुष्टात्मा यवनो दुष्टदुर्मदः ।
असौ महाराजमित्रो वैरिणोऽपि कृपानिधिः ॥

has only the advantage of mine as to the antepenultimate syllable of the first half, viz. the 2nd दु being somewhat more like what appears on the stone. In every other respect where there is any difference, any one may see how entirely he varies from the characters there visible, beside being incorrect in grammar and prosody, and quite unintelligible. Only three syllables of mine are conjectural, in a place where the stone is broken.

VI. All of this verse, which is not distinguished by small letters, is most clearly traced on the stone: but the B. P. has retained nothing of it but the three first syllables of the second line, (in which also he has thrust in another syllable with a *visarga* without warrant) in his reading, which is—

तदा सम्राट् महातेजाः शास्ति साहमहम्मदः ।
ततः श्रुत्वा स यवनः तत्कीर्त्तिं कोपसंयुतः ॥

most entirely gratuitous! beside that it annexes the first to sl. 5, and begins the 6th with the other.

VII. VIII. In these two verses, between which there is an interval in a broken part of the stone sufficient to contain a half-sloka or line, and which may throw some reasonable doubt as to the precise divisions of the slokas or distichs, the B. P., who divides differently from me, has not attempted to retain any thing of the yet remaining large characters on the stone, except in the first line, and the beginning of the last but one; while any one who compares his reading with mine, will see how much more he varies from his original. His reading is in five lines, as follows:

सहस्रासीतिभल्लिकैः धनुर्वानैरसंख्यकैः ॥ [Here वाण *an arrow* is misspelt.]
आगत्य दुर्गं रुरुधे नतुस्थानेषुसर्वतः । [No संमर्दने as on the stone.]
प्रविवेश च तं दुर्गं सव्यश्च सह सैनिकः ॥ [A false concord here.]
ततस्तु सर्व्वे तत्स्थानं समाक्रान्तं प्रयत्नतः । [All but the first syllables quite incompatible with the stone.]
अयजादेशमाकर्ण्य स्वामिराजः पुनः स्वयं ॥

IX. This the B. P. read quite differently; but any person comparing his two first lines with mine, may judge which is the nearest to the actual inscription. His third line is altogether gratuitous.

ततस्तत्याज सामात्यः तं दुर्गं स कियद्दिनात् ।
नूनं स तेषु देशेषु साम्राज्यं कृतवान् स्वयं ।
तत आगत्य यवनो जग्रे राज्यं स दुर्मतिः ॥

X. In this sloka, which is in the lyrical measure called *Sárdúla vikrídítem*, the B. P. has made the following very serious mistakes, 1st, making its *second* páda or hemistich the *first*, (reading it otherwise quite correctly) to the exclusion of all the legible syllables of the first páda, whose place in the measure is so palpable, viz. the 3rd, 4th, 5th, 6th, 15th, 16th, 17th, 18th and 19th or last, which are on the stone clearly as they are here represented in large letters [having gratuitously supplied their place by a 3rd *Anustábh* line to verse IX.!] 2ndly.

Filling up the place of the 3rd and 4th pádas by a crowded *three* of his own making entirely, except the eight last syllables of the last—though so much more of them are *clearly legible* on the stones at their proper intervals—just as I have placed them in the midst of the conjectural supplements. The B. P. has

संग्रामे परवीरदर्पदलनः श्रीस्वामिराजोऽभवः ।
पूर्व्वं प्राप्य सहोदरादरवशाद्राज्यं गुणी धार्मिकः ॥

(This 3rd páda has a glaring false quantity.)

पश्चात्प्राक्तनखीयकर्मवशतो दौर्भाग्यभावोदयात्
षाड्गुण्यादि गुणान्वितोऽपि स पुनः तत्याज दुर्गं स्वयं।

XI. This last verse, which is *Anustabh*, like the nine first, is read by the B. P. as I read it, except that the 2nd quarter is with him संस्थितश्च कियद्दिनं quite unlike the stone, and that the 3rd he begins differently, viz. पश्चात्तत्क्षपयागत्य। borrowing to this place what he had omitted in the 2nd. The stone gives clearly throughout what I have written above.

After the date and the word गुरौ, the B. P. has gratuitously expanded the rest into a sloka, as follows:

गुणसौ राजदेवोऽयं शरणागतपालकः ।
सहबद्दीनयवनः क्षतो येन सुरंजितः ॥

I will add, that the inscription, as it is now legible, affords no countenance to the B. P.'s supposition, that the discreet Sva'mi Ra'ja acted under his elder brother Chandragana. He rather appears to have been his successor. W. H. Mill.

Barahát Inscription.

No. III. of the same plate, is the inscription from *Barahát* in *Garhwal,* presented, in duplicate, to the Society by the Commissioner, Mr. Traill. This inscription also has been deciphered in part by the Rev. Principal of Bishop's College, who has kindly communicated its contents to me in the following letter:

"I have the pleasure of sending one of the *Kemáon* inscriptions, that of *Barahát* in *Garhwál.*

It opens with the invocation स्वस्ति श्रीः *Svasti Srí,* addressed apparently to a prince, and the first line contains the words यस्य यत्र हर्म्म यच्च क्षोच्छ्रितं दीप्तं 'whose and where is a palace which is on a lofty peak and splendidly magnificent.' The second line of the inscription is a turgid verse in the *Sárdúla vikrídita* measure, as follows:

पुत्रस्तस्य महर्त्तसूर्य्यशुभुक्सेनोन्नतोरुस्थलः
कामत्यागनयैरनद्धधनुरप्यासीन उद्यंस्तनः ।
नाम्नाग्ये तु य इत्युदारचरितः सद्धर्म्मधीरः स तां (understand सेनां)
सक्षीरोत्तम चारथप्रमथनीं मग्नश्चकारायतः ॥

"His son, whose ample condition was exalted by a numerous army, devouring the juices of the earth like the sun of summer, then arising sat on the throne, and even with his bow unbent, still ruled with

sage counsels, and the abandonment of all selfish passions. He who was originally by name *Udára-charita*, (the man of generous deeds,) being skilled in all holy duties, did even thus at once, as the best of the lords of power, reduce to fragments the army opposed to him, though crushing all other adversaries, chariots and all."

This is the whole of the second line. The third and last which is in prose begins प्रीतः प्रीतस्य "the beloved son of a beloved father, and ends with the words तिलकं यावदङ्गे पिधत्ता तावत्कीर्त्तिः" सुकीर्त्तयोरचरमथ तस्यास्तु राज्ञः स्थिरम् "As long as the sacred mark remains in the body, so long has the glory of these two illustrious ones (father and son) been concealed: but henceforward may the immortality of this king be unshaken!"

The meaning is not very good, and the word सुकीर्त्तः for Illustrious, is unusual, if not semi-barbarous, in its formation; but I can make nothing better of it, neither can I spell out the father's name from the strange characters of the first line. The second one is the only part on which I have no doubt. W. H. MILL.

Iskardo Inscription.

No. 3 *of Plate IX.* is a copy of the inscription on a granite rock near Iskardo, the capital of Little Tibet, taken by Mr. VIGNE, the English traveller, who sent it down through Captain WADE in hopes that M. CSOMA DE KÖRÖS would be able to decypher it.

Being found under an image of Buddha, it may be concluded that this inscription is but an extract from some of the sacred volumes of his followers; but it is in too imperfect a state for M. CSOMA to be confident of the rendering, although a large portion of the letters may be read with ease and certainty. Their accurate form would pronounce them to have been copied by an artist, if not by one acquainted with the Tibetan alphabet.

Ajunta Inscription.

No. 4 *of Plate IX.* This mutilated inscription is from the caves of Ajunta. I am indebted for it to Mr. RALPH and Capt. GRESLEY, of Aurangábád, who paid a visit to those celebrated excavations last year, and I am not aware that this particular inscription has been yet published.

Mr. RALPH states that it was found "not in the largest Bauddha cave, but in the first which we inhabited, and the one where a square was formed by four pillars each way. The letters were on the right hand of a doorway of a small apartment leading into one containing the figure of BUDDHA; but here he was not represented with the two African statues of attendants, nor is this the cave where the Grecian helmets are found. The rough sketched countenances which are plac-

ed under the writing are in keeping with those that cover the whole of the little chamber, at distances of two or three inches from one another —these appear to be portraits of disciples seated,—all half lengths."

Captain Gresley has favored me with a ground plan of the cave from memory, but as accurate measurements were taken by Dr. Bird in 1828, for Sir John Malcolm, for the Royal Asiatic Society, it is unnecessary to insert it.

"The large cave, 40 feet square within the eight columns, has more brilliant figures in fresco painting than any I have visited. It is the one which contains what some have miscalled the *zodiac*, a portion of a large circle on the wall outside the first cell on the left hand on entering the cave-temple, where many small figures may still be traced." Some damage has been done since 1828, and it is the opinion of these travellers that time and rain will soon render the caves altogether inaccessible.

The first letter of the inscription is sufficient to shew to what alphabet the Ajunta writing belongs: it is precisely the *y* of the Allahabad and Gujerat inscriptions; the second letter is *dh* of the same alphabet, and the third is the *m* of the coins of the same period, differing slightly from that of both the inscriptions above named.

The collocation of these three letters, agreeing exactly with the commencement of the sacred text so constantly found on all the ancient Buddhist images lately brought to notice from Ava, Benares, or Tirhút, *Ye dharma*, &c., led me to look for the remainder of the stanza; but it was evident that the text would not bear such a construction. Perhaps the Rev. Mr. Stevenson, whose attention has been successfully engaged on the Carli inscriptions, than which however the present seems considerably more modern, may be able to fill up the chasms and rectify the mutilations of this short legend, if indeed it be worth while to do more than recognise and record the style of *Nágari* to which it belongs.

No. 5 of Plate IX. is merely a word in an inscription from the *Behtari* column, *Ghazipur* district, concerning which, as it occurred on the Allahabad column, a difference of opinion existed: Captain Troyer reading it *Yagna Kacha*, and Dr. Mill, *Ghatot Kacha:* the latter is evidently the most probable, if it be not quite certain; but I hope to be able to insert the whole inscription (taken down with great care by Lieut. A. Cunningham, Engineers) in my next number, with a full interpretation by the Rev. Principal of Bishop's College. I had lithographed it as Plate VII. to precede the present two, but the translation was not ready for insertion. J. P.

IV.—*Descriptive Catalogue of Terrestrial and Fluviatile Testacea, chiefly from the North-East Frontier of Bengal. By* W. H. BENSON, *Esq. B. C. S.*

The species of land and fresh-water shells described in the following pages, form a collection, chiefly made in the hills on the N. E. frontier, which was purchased by the Asiatic Society of Bengal in 1833. One of the land shells, *Scarabus triangularis*, and two *Neritinæ* and a *Melania* among the fluviatile shells, inhabit the jungles and streams of the Gangetic Delta, and were probably collected on the route to Sylhet. Several shells belonging to the genera *Cerithium, Cancellaria, Planaxis, Phasianella,* and *Pedipes,* which occur in the collection, have been omitted, as being, in all probability, marine, or semi-marine productions procured from the embouchures of the Deltaic rivers.

1. *Vitrina Gigas.* Testâ tenui, corneo-virente, ovato-depressâ, auriformi, velociter crescente, suprà planatâ, rugis concentricis et striis radiatis decussatâ; subtus tumidâ; ultimo anfractu valde ventricoso, penè totam testam efformante; aperturâ transversâ, rotundato ovatâ, prægrandi; labio valdè arcuato. Diam. 1.15 poll.

This shell is so flattened, and enlarges so quickly, that it has very much of the appearance of one of the *macrostomata,* to which I referred a specimen from the caves of Sylhet, recently fossilized with calc-tuff, when I first saw it. It has only two whorls exclusive of the apex, and differs in size, in the depression of the spire, in the very arcuated left lip, and the more extended mouth from the European species *V. elongata.* I believe that it is the first shell truly belonging to this genus which has been ascertained to inhabit India. Since I became acquainted with it, I have met with a second species alive, adhering to dead leaves at the roots, and to the lower part of the trunks of trees in the teak-wood attached to the Botanic Garden of Calcutta; but the characters of the animal restrict it to the genus *Helicarion* of CUVIER. Whether *V. Gigas* belongs to CUVIER's *Helicolimax* or to *Helicarion,* cannot be ascertained without an examination of the animal; I therefore leave it in the original genus as defined by LAMARCK.

2. *Nanina decussata.* Testâ corneâ, discordeâ, sub-depressâ, umbilicatâ; spirâ exsertiusculâ, obtusâ; anfractibus septem suprà planatis, ultimo obtusè angulato; epidermide suprà argutè decussatâ, infrà radiatim striatâ; apertura transversâ, lunatâ. Diam. 1 poll; axis 0.35

On a cursory inspection of this shell, I erroneously considered it to be a variety of the species "*vitrinoides*" DESHAYES, belonging to Mr. GRAY's genus *Nanina,* (Zool. Proceedings, 8th July, 1834,) which I indicated under the name of *Macrochlamys* in the first No. of the Jour-

nal of the Asiatic Society for January 1832, pp. 13 and 76, and which I altered to that of *Tanychlamys* in a paper on the genus read before the Zoological Society in August 1834. Mr. Gray's characters, drawn up from specimens preserved in spirits, and from General Hardwicke's drawings, having the advantage of priority of publication, his name, although inexpressive, will necessarily be adopted. Several independent observers have united in stating the necessity of separating this genus from *Helix*, on the characters of the animal; witness the observations of Lieut. Hutton, Journal of the Asiatic Society, vol. iii. p. 83.

The species under review differs from *N. vitrinoides* in sculpture, has a more exserted spire than the generality of specimens of that shell, has a more angular periphery, is of a lighter colour, and, possessing the same number of whorls, is larger and of a thicker substance. The epidermis is apt to peel off the under side.

I have a third species belonging to this country, which I lately took at the foot of the Rajmahal hills. It differs in its smaller size, its lighter colour, and in the form of the aperture from both *vitrinoides* and *decussata*, and from the former it altogether differs in its habits even when inhabiting the same spot, abounding on shrubs and bushes, while *N. vitrinoides* is confined to the ground, to rocks, and to brick work.

3. *Helix plectostoma.* Testâ reversâ, depresso-conoideâ subtùs tumidâ; spirâ exsertiusculâ; anfractibus suprà planatis, radiatim plicatis, rugis transversis decussatis; ultimo angulato, angulo subtùs marginato. Aperturâ lunatâ, plicâ, (ut in Helice personata) interdum inconspicuâ, ultimo anfractui adhærente; umbilico profundo, anfractus plerosque exhibenti. Diam. 0.35 poll. paulo plus.

This shell has a salient plate on the penultimate whorl connecting the two extremities of the peristome, as in *H. personata*, but differs from it in its other characters. The peristome is more rounded than in *H. Cocyrensis*, the spire more conoid, and the satures less conspicuous. It belongs to the subgenus *Helicodonta* of De Ferussac, but in the angularity of the periphery it approaches to *Helicigona*.

4. *Helix Oxytes.* Testâ ferrugineo-corneâ, depressâ; spirâ convexâ, apice planato; periphæriâ acutâ; anfractibus obliquè subplicatis, suturis non excavatis; peristomate subreflexo; umbilico lato et profundo anfractus usque ad apicem exhibenti. Diam. 1.8 poll.

In form it exactly resembles *H. acumen* of Dalmatia, but exceeds it in size, and differs in colour, in its sub-reflected mouth, and in sculpture, the whorls being destitute of decussating striæ and of the polish which adorns the latter. It belongs to De Ferussac's groupe

of *Helicigona*, and to the 2nd division, *Vortices*. It would stand as a *Carocolla* of LAMARCK. Whorls six, exclusive of the apex.

5. *Helix climacterica*. Testâ subdepressâ, subtùs tumidâ; spirâ sub-conoidea, gradatâ; anfractibus omnibus angulatis, suprà planatis, argutè plicatis; apice obtuso. Periphæriâ angulatâ. Peristomate acuto, non reflexo. Umbilico nullo. Diam. 0.75 poll.

This species resembles *H. barbata* of Cephalonia in its general habit and in the peculiar form of its spire, which rises like a flight of steps; but the apex, though obtuse, is more exserted, and is destitute of the flattening observable in the Cephalonian species. Whorls eight, exclusive of the apex. It belongs to *Helicigona* of DE FERUSSAC, and to its first groupe, which is destitute of an umbilicus.

6. *Helix Serrula*. Testâ subdepressâ, sub-conoideâ subtus convexâ; apice acuto; anfractibus suprà confertissimè radiatim plicatis, marginatis, marginibus elevatis; ultimo anfractu infrà læviore, periphæria marginatâ, serratâ. Umbilico profundo, mediocri; peristomate acuto. Diam. 0.55 poll.

Whorls seven, exclusive of the apex. This is also a *Helicigona*, 2nd groupe. It is allied to a new unnamed species which I have from Malta, but has a smaller umbilicus in proportion, and a more acute spire. It is also larger.

7. *Helix tapeina*. Testâ sub-conoideâ, suprà convexâ, subtùs tumidâ; epidermide minutissimè corrugatâ; periphæriâ angulatâ, peristomate non continuo, subreflexo. Umbilico mediocri, profundo; omnes anfractus exhibente. Diam. 0.6 poll.

Whorls seven, exclusive of the apex. It is allied to *Carocolla Lapicida*, but differs in sculpture, in its discontinuous peristome, less angular periphery, and more conoid spire. The aperture is also more open. It belongs to the 2nd groupe of *Helicigona* of DE FERUSSAC, and to the genus *Carocolla* of LAMARCK.

8. *Helix delibratus*. Testâ depresso-planâ, subtùs tumidâ; epidermide corneâ deciduâ; anfractibus transversè striatis; aperturâ transversè rotundato-ovatâ; peritremate vix continuo, reflexo; umbilico lato, anfractus plerosque exhibente. Diam. 0.9 poll.

Whorls four. Of the same type as the European species *H. cornea*, from which it differs in colouring and in the form of its spire, which resembles that of *H. deplana* of Croatia; but from this species it differs in the form of the mouth, and in the markings, as well as in its more open umbilicus. From *Helix granulata* (mihi) of the Western Provinces, it differs in the more transverse mouth, more flattened spire, and wider umbilicus, in its plainer colouring and greater size, and in the want of that minute shagreened appearance, under the lens, which

renders that species so remarkable. It belongs to the subgenus *Helicella* of De Ferussac. The epidermis scales off like that of the *Solenes*, whence the trivial name which I have conferred upon it.

9. *Helix Cestus.* Testâ subdepressâ, corneâ vel fuscescente, radiatim striatâ, subtus convexâ, perforatâ; spirâ sub-conoideâ; apice obtuso; ultimo anfractu sub-angulato, fasciâ unicâ rufo-fuscâ, mediâ, reliquis fasciâ saturali cinctis; peristomate sub-reflexo. Diam. 0.65 poll.

Whorls five. *H. cestus* approaches in form and colour to a species which I possess from the Tyrol, and which is marked "*H. zonata*," but which does not agree well with Lamarck's characters of *planospira*, of which he gives De Ferussac's *zonata* as a synonym. It differs from it in not having a white or a much reflected peristome. It belongs to the sub-genus *Helicella*.

10. *Bulimus citrinus.* Lamarck.

This is the reverse variety of a handsome shell, of which South America is recorded as the habitat by Lamarck. It is perforated, (of which character he makes no mention,) and of an uniform yellow, without bands or marks, and being weathered, no polish is observable. Length one inch.

11. *Achatina tenuispira.* Testâ elongato turritâ, corneâ, longitudinaliter striatâ, versus apicem attenuatâ, columnari; anfractu ultimo interdum fasciis quibusdam albidis transversis ornato; suturis impressis; apice obtuso. Long. 1 poll. circiter. Lat. 0.55.

This *Achatina*, belonging to De Ferussac's subgenus *Cochlicopa* and to his groupe of *Hyloides*, is remarkable for the attenuated columnar form of the terminal whorls of the spire.

12. *Achatina crassilabris.* Testâ turrito conicâ, lævi, corneâ, longitudinaliter striatâ; anfractibus convexis, suturis excavatis; labro intùs incrassato; columellâ præarcuatâ; apice obtuso. Long. 0.7. Lat. 0.3 poll.

This shell has the habit of a Ceylon species which I believe to be *A. nitens* of Gray. It differs in greater size, in its incrassated outer lip, in its somewhat more ventricose form, and in its sculpture. It approaches to Swainson's genus *Achatinella* in the arcuation of the columella, but differs in the absence of the thickened pliciform termination to it, and in having the incrassation quite at the edge of the outer lip, instead of removed to a little distance within it.

13. *Clausilia loxostoma.* Testâ sinistrorsâ, fusiformi, medio ventricosâ, corneo-grisescente; anfractibus convexis, lævigatis, striis obsoletis; suturis confortissimè crenulatis; aperturâ elongatâ obliquâ, bi-plicatâ, suprà angustiori, infrà dilatatâ peristomate reflexo; columellâ præarcuatâ. Long. 0.85 poll.

Out of a collection of 32 European *Clausiliæ*, I find none with a similar obliquity of mouth, from which character I have named the species. The outer lip projects beyond the plane of the aperture. The crenulations of the sutures differ altogether from the papillary appearance which is common to several species, such as *papillaris, alboguttata*, &c., and they are not elongated as in *C. nitida*.

14. *Scarabus triangularis*. Testâ compressâ ovato-conica, ætate subtriangulari, cornea, fasciis castaneis plurimis interdum obsoletis cinctâ, rugis longitudinalibus salcisque transversis, distantibus, interruptis decussata. Spirâ acutâ breviori; suturis obsoletis. Anfractûs ultimi varice saliente lamelliformi. Aperturâ quadridentata, biplicata; dentibus, uno insuper columellarium, tribus super costulam introlabialem sitis; plicâ unâ columellarii duplici, pandatâ, alterâ columellæ recurvâ, parvâ. Umbilico lineari, transversali, penè clauso. Length 0.9. Breadth 0.65 inch.

This shell, independently of its form, sculpture, colouring, and acute varix, may be at once distinguished from *Scarabus imbrium* by its peculiar umbilicus; that feature being rounded and perforate in the Malassan species. The number of teeth on the rib, which is situated at some distance within the outer lip, is very variable, ranging from three to seven; of these three are always more prominent. In weathered specimens the subordinate denticulations are generally unobservable. Occasionally the whole of the shell is of a dark chestnut colour, with obscure bands of a more saturated colour. In his Synoptical table, DE FERUSSAC mentions two species from Bengal, *S. plicatus* and *S. Petiveri*, both distinct from *S. imbrium*. As he gives no description, I am unable to say whether our shell is identical with either or both: the latter contingency may possibly be the case, considering the great difference of form observable between young and aged specimens, and the uncertainty attendant on the species *S. Petiveri*, which appears to have been established solely on the inspection of a plate, no reference being made to any museum.

All the specimens of the shell in the collection are weathered, and in that state appear of a livid purple colour; this circumstance was, however, amply compensated for by an excursion which I made with Dr. PEARSON to the alluvial island opposite to Fort William, in quest of objects of natural history, during which that gentleman discovered the live animal under decayed vegetation, and under bundles of the *hoogla* grass cut down for sale. From these retreats, which it occupied in company with the amphibious *Assiminia Gangetica*, we made a large collection in a short space of time. I have searched for it in vain on the neighbouring mainland, in the vicinity of the Bishop's

College and the Botanic Gardens, as well as on the opposite side of the river; but specimens of deserted shells were taken by a friend, as low down as the junction of the Damoda with the Hooghly.

It is only of late that French naturalists have verified the terrestrial habits of the genus. The present species is much distressed when thrown into water, and crawls out of it when immersed. Its decidedly amphibious companion, *Assiminia Gangetica*, I have met with, on dewy mornings, more than a furlong from the river's bank, crawling among moist grass.

15. *Cyclostoma involvulus.* (Muller.)

This elegant species, which is abundant in a living state at Rajmahal, Secrigally, and Patharghâta in Behar, attains a large size in the Silhet collection. When adult it is always possessed of a beautiful orange colour on the peristome. It is *Cyclostoma torquata* of Lieut. Hutton, J. A. S. vol. iii. page 82, and is the species alluded to by me in vol. i. page 12, in my remarks on the genus *Pterocyclos*.

16. *Cyclostoma zebrinum.* Testâ albidâ, strigis plurimis rufo-custaneis, angulato-flexuosis pictâ, spirâ depressiusculâ, acuminatâ; anfractibus plicis paucis transversalibus distantibus, ultimo rugis undulatis longitudinalibus sculptis; carina mediâ subacutâ. Aperturâ amplâ, peritremate reflexo; umbilico parvo. Epidermide crassâ, fuscâ, plicis longitudinalibus, his setis fortibus munitis, instructis. Diam. 10.35 poll.

I was at first disposed, from a consideration of the habit of this shell, to view it as a variety of a Tenasserim shell, described by Mr. G. B. Sowerby in the 5th volume of the Zoological Journal under the name of *Cyclostoma perdix;* but a careful comparison with specimens which Mr. Sowerby had kindly presented to me, has enabled me to distinguish it as a separate species. It differs in its sculpture, in its more developed keel, more contracted umbilical cavity, and in the possession of a singular epidermis, of which Mr. Sowerby's specimens of *C. perdix*, though one was taken alive at Tenasserim, appear to have been destitute. In the latter species the markings are white mottled on a chestnut ground; in *zebrinum* they consist of distant zigzag flames of light chestnut on a white ground.

17. *Pterocyclos hispidus.* Spiraculum hispidum, Pearson, Journal of the Asiatic Society, vol. ii. p. 391.

The acquisition of several live specimens of this genus (established by me in the first No. of the Journal) during the last rainy season, at the hill of Patharghata in Behar, where I first met with dead specimens of *P. rupestris*, enables me to disprove the conjecture of Dr. Pearson that a branchial apparatus or projecting syphon is attached

to the neck of the animal, as well as to confirm its affinity with the genus *Cyclostoma*, with which Mr. SOWERBY has classed it. The name originally annexed to the genus was altered by Dr. PEARSON, on insufficient grounds, as, independently of the violation of received rules of nomenclature*, of the existence of the tabular appendage in perfection in only one species of the genus, and its non-existence in others, the new name tended to convey an erroneous impression of the use of the anomalous excrescence observable in the shell of *P. hispidus*.

Dr. PEARSON assumes that the specimens of *P. rupestris* from which the characters of the genus were taken, were immature shells, but a strict search in the habitat of the species, and the acquisition of 16 specimens of different ages and growth, of which 12 bore all the marks of being adult, dispelled all doubt of the obtainment of the perfect shell. The retromitted and retroverted tubular wing, affording an index of a former mouth, and which does not appear to have been accompanied by a reflexion of the peristome, exists in that form in *P. hispidus* only, and the sinus under the wing which crowns the final aperture is never so strongly marked as in the other species, bearing more resemblance to the channel under the wing of GRAY'S *Cyclostoma Petiverianum*, which shell indicates the passage to the Genus *Cyclostoma*, not only by this feature, but by the intermediate form of its umbilical cavity, and its operation.

A comparison of the animal of *Pterocyclos* (my four living specimens of which I assumed to be female, from the absence of the exserted organ so conspicuous on the neck of the male *Cyclostoma)* with that of *Cyclostoma involvulus* shewed only the following differences. In *P. rupestris* the mantle is sinuated, to correspond with the sinus at the crown of the aperture, and its edges are reflected over the edges of the sinus, but there is no organ projected through it by

* In conferring generic names it is an obvious rule that the part should not be put for the whole, by designating the genus from an organ, without a change of termination, or the addition of a distinguishing epithet. The circumstance of the feature being peculiar in the family to which the groupe belongs, will not justify a departure from the rule; were a relaxation from it allowed in one instance, we might be called upon to recognize an anomalous form among the acephalous mollusca (to suppose an extreme case) as the genus "Caput!" In the present instance the effect of the proposed substitution, is to set aside a name published by the first describer of the genus, which name is equally applicable to every species hitherto discovered, as it is not contingent on the presence or absence of a sinus or a tabular, or other perforation, but on the existence of a wing attached to the otherwise circular aperture. Hence the supposed necessity for a change of nomenclature is not apparent.

the animal, nor does the mantle line the interior surface of the wing. No organ likely to occupy the sinus is observable either when the animal is crawling or when it is drawn out to its fullest extent. The foot is shorter in proportion than that of *Cyclostoma*, hardly appearing beyond the disc of the shell when the animal is crawling, and the curious cup-shaped operculum is received into the wide vortici-form umbilicus of the shell, which it almost fills, whereas the thin flat operculum of *C. involvulus* is carried behind the shell.

My living specimens of *Pt. rupestris* were taken at Patharghata* during a morning shower in September. I had in vain searched the ground and bushes among the moist rocks and dripping jungle, where multitudes of *Cyclostoma involvulus*, the reversed *Helix interrupta* and *Nanina vitrinoides* were moving about, and had nearly abandoned the search, when I thought of trying an open tract of the hill whence the jungle had recently been cut. Here, on the exposed side of the hill, as well on the bare surface, as under leaves, I at last discovered the sought-for shell. At the foot of the hill a single specimen of a small conoid *Helix*, which I had recently discovered at Berhampore, was found adhering to the leaves of a shrub.

Pterocyclos hispidus, is perfectly distinguished from *P. rupestris* by its greater size, the flatness of its spire, its sculpture, hispid epidermis, retromitted tube, and the inferior development of the adult mouth. Coming from a climate where it enjoys damp throughout the year, it may possibly use the perforation for a breathing hole when its aperture is closed, but in *P. rupestris* the operculum is drawn in beyond the sinus, so that no such use can be made of it for breathing air, for which, moreover, it has probably little occasion during the season of drought and torpidity.

18. *Pterocyclos parvus*. Spiraculum parvum, Pearson, Journal of the Asiatic Society, vol. ii. p. 592.

This species, which is coloured like one of the varieties of *P. rupestris*, never attains more than half the size of that species. The numerous specimens brought from Silhet have all a perfect, reflected peristome. It is also distinguishable by the greater tendency of the sinus being often in strict contact, though the circle is never completed by

* Besides some other plants in flower which I had not leisure to note, I observed a little blue-flowered *Tradescantia*, a dwarf *Ruellia*, and a beautiful large-flowered *Pesticia* with spikes of flowers of a pale verdigris-green colour, which I had only once before seen ornamenting a corolla in a species of *Ixia (J. maculata ?)* In December 1831, the jungle on the side of Patharghata was flaming with the rich blossoms of *Holmskioldia coccinea*. On Kotanási, a hill between Patharghata and Terriagali, I captured a fine specimen of the splendid *Buprestis Chrysis*.

the confluence of the shelly matter. The impending wing also shews a greater tendency to a retroverted and tabular form.

It is probable that SOWERBY's *Cyclostoma bilabiatum*, from Salem in the Madras presidency, will form a fourth species of *Pterocyclos*, distinguished by the sinuated addition at the back of the true lip. When I examined it in London, I thought that it was identical with *P. rupestris*, and that my specimens of the latter had not attained their full growth; a further search in the locality of the species, and the consideration that the sinuated lip must have been of previous formation to the reflected circular aperture, have contributed to alter my opinion on the subject.

Cyclostoma suturale has the aspect of an immature *Pterocyclos*. Its habitat is, I believe, Demarara.

I had prepared the whole of my notes on the collection both of land and fresh-water shells during a period of leisure previously to the close of last year, but I have since then been prevented by want of time from correcting and arranging them. Dr. PEARSON's hint, in his report on the Museum, has called forth this first brochure, consisting of the land-shells, I fear in rather an unfinished state, for which I trust that circumstances will prove an apology. The fresh-water shells shall follow at the earliest practicable period.

V.—*Description of two new species belonging to a new form of the Meruline Group of Birds, with indication of their generic character. By* B. H. HODGSON, *Esq. Resident in Nèpál*

These birds have the wings, tail, and feet of *Turdus;* and if we continue the comparison from the external to the internal characters, we find a similar construction of the tongue, stomach, and intestines in both.

Both, too, have a similar regimen, habits, and manners. Yet they are strikingly contradistinguished by the respective forms of the bill. In the thrushes that member is compressed, and has its arched maxilla freely exserted from the frontal feathers, and very little cut out by the nasal fossæ. In the birds now in question, on the contrary, the bill is so much depressed as to be more than twice as broad as high at the base; and its straight maxilla, greatly incumbered by the frontal plumes, has the nasal fosse so far produced to the front as to pass the centre of length of the bill.

In the birds before us, too, the head is furnished with a garruline crest; which is never observed in *Turdus*. The tarsi are lower than in the generality of thrushes; and the tail is somewhat longer and less even at the end. Like most of the Nipalese thrushes, these birds are common to all the three regions of the kingdom. They are shy in

their manners, adhere exclusively to the woods, live solitarily or in pairs, breed and moult but once a year, nidificate on trees, and feed almost equally on the ground and on trees. I have taken from their stomachs several sorts of stony berries, small univalve mollusca, and sundry kinds of aquatic insects.

These birds are not generally or familiarly known to the Nipalese, but the foresters, whom I have met with, denominate them *Cocho :* and by that name, latinised into *Cochoa,* I have designated them generically in my note book.

As a *Meruline* genus, placed close to *Turdus,* the following character may perhaps serve to mark them.

Wings, tail, and feet, as in *Turdus.*

Tarsi rather lower and tail somewhat longer.

Bill straight, considerably depressed : the maxilla excided beyond the centre by the nasal fosse : the nostrils very large, and nearer to tip than to gape. Head crested as in *Garrulus.* The two species at present known to me I shall call, from their prevalent colour, *Viridis* and *Purpurea.*

The following is their description :—

Cochoa purpurea. Purple Cocho, Mihi. Male, dark purple : cheeks black : crest, tail, and upper apert portion of the wings, soft grey blue, more or less purpurescent : lower part of the wings and tip of tail, black; and both black internally : a white speculum on the wing, just below the false wing : bill and legs black : iris brown. The female, brown where the male is purple ; and the upper part of the wings also brown. The young are rufous below with black bars : brown above with rufescent white drops : head blue as in maturity, but barred. The species is eleven to eleven and a half inches long by sixteen to seventeen wide, and weight three and half to four oz.

Co. Viridis. Green Cochoa, Mihi. Brilliant parrot green, paler and changing into verditer blue on the belly and thighs : crest, cheeks, and neck posteally, brilliant blue : upper part of the wings and tail, the same, but paler with a grey cast; and both black internally, and apertly towards the ends, as in the preceding species; through the eye to the nostrils black : bar of same hue across the pale portion of the wings, caused by the long coverts and bastard wing being tipt with that colour : legs fleshy brown : bill black : iris brown : size of the last : sexes alike.—N. B. This species is apt to vary considerably before it has reached maturity as well as under moult, when the back is sometimes lunated with black ; and the soft blue portion of the wings is smeared with brownish yellow. At first, the young males are exactly like the female. The following more particular description of

the several members and organs is equally and exactly applicable to both species.

Bill to head as five to four: sometimes merely equal to the head: considerably depressed, except near the tip; at base more than twice as broad as high; straight; culmen produced among the frontal feathers, which are soft and turned back; sides of the maxilla cut out beyond the centre by a broad membranous and plumose fosse: tomiæ locked, trenchant, and entire; towards the gape somewhat incurved—towards the tip, straight: tip of upper mandible inclined and notched; of the lower, subrecurved and subemarginated, sometimes straight and entire. Nares nearer to the tip than to the gape; at fore end of the nasal fossæ, lateral, longitudinal, elliptic, large, free, shaded above by a small nude process of the fossal membrane, and set over with tiny incumbent hairs: gape scarcely to the fore angle of the eye and subciliated: wings reaching to centre of tail, firm, first quill bastard, second long, fourth longest; all four slightly emargined on their inner web. Tail composed of twelve firm feathers, rather longer than in *Turdus*, the four laterals gradated in a small degree, more than in *Turdus*.

Tarsi submedial, stout, rather longer than the central toe, usually smooth, sometimes crossed by three or four scales.

Toes simple, ambulatory, compressed, moderately unequal; outer basally connected; hind stouter and subdepressed.

Nails compressed, obtuse: the central fore with both margins dilated but entire.

Head furnished with a soft, full, garruling crest. Tongue simple, flat, medial, subcartilaginous, with cartilaginous, subjagged, tip. Stomach muscular, of medial subequal thickness, the lining tough and grooved. Intestinal canal 20 to 25 inches long, of subequal calibre throughout; close to anal end, two grain-like cæca.

The intestines are longer in proportion than those of *Turdus:* but otherwise similar.

VI.—*On a New Genus of the Meropidæ.*—*By the same.*

Order INSESSORES; Tribe FISSIROSTRES; Family *Meropidæ, Vigors.*

Order PASSERES, Section SYNDACTYLI, *Cuvier*. Genus new. *Bucia,* Mihi.

Generic character:—

Bill much elongated and arched throughout, strong, greatly compressed; the sides nearly vertical, and the ridge flattened towards the base. Wings moderate, full, not acuminated, fourth quill longest,

one and two considerably and subequally gradated. Nares entirely concealed by incumbent setaceous tufts. Tail longish, quadrate, strong. Feet and tongue as in *Merops*. In the family of the *Meropidæ* but one genus has heretofore been recognised. If the above characters be admitted to differ materially from those of *Merops*, and if the birds to which they apply are distinguished by a marked and consequent diversity of manners, I presume the propriety of the generic separation will not be questioned.

Now, the bee-eaters proper, according to my experience, have invariably a long and acuminated wing, and aërial swallow-like habits corresponding to that form of wing. Again, their bill is considerably spread laterally except towards the tip; the general form being tetragonal, and the ridge acute.

In *Bucia*, on the contrary, the wing is not so much acuminated as in the thrushes. It is distinguished for considerable, uniform, breadth; not at all for length; and the habits of the bird are quite foreign to perpetual questing on the wing in the open country: they lead it to seek the deep recesses of the forest,—and there, tranquilly seated on a high tree, to watch the casual advent of its prey, and, having seized it, to return directly to its station. The bill, again, is greatly compressed with vertical sides and ridge flat towards the base, convex towards the tip. This organ is, moreover, strong, longer, and more arched than in *Merops*. The *Buciæ* are of rare occurrence, and are solitary woodlanders; whereas the bee-eaters proper are gregarious, and common tenants of the champaign. Our birds are found in the lower and central regions of Nepal; but seldom or never in the northern. The Nipalese call them *Bukay-chera; chera* being merely a corruption of *chiria*, or bird. I latinise the former word to procure a generic appellation.

I have as yet discovered but one species, of which the following is the specific name and character.

Bucia Nipalensis. Nipalese *Bucia*, Mihi. Bright parrot green, shaded on the belly and vent with bright buff: lining of the wings and lower tail covert, pure buff: wings internally and basally, and tail on the inferior surface, the same: forehead and gular hackles, blue: the last, formed of a double series of long, composed, drooping plumes, ranged opposite to each other on either side the trachea: bill plumbeous, with black tip: iris brown: legs greenish yellow. Length thirteen to fourteen inches: breadth between the wings seventeen to eighteen: weight three to four oz.: sexes alike.

The bill is more than twice as long as the head. It has a considerable and uniform arcuation throughout; is hard, strong, entire, very moderately excavated internally; at base scarcely broader than high;

and nearly twice as high as broad immediately beyond the base. The ridge above, though narrow, is quite flat from the brow to the centre of length; beyond it and below, convex. So great is the lateral compression, that the sides are plane and nearly vertical: the cutting edges are trenchant and unemarginated: the tips pointed and nearly equal. The nares are rounded, lateral, basal; the fossæ evanescent; the aperture covered closely by a small incumbent tuft of setaceous plumuli.

The tongue is long, flattened, pointed, cartilaginous, and feathered towards the tip. The gape is scarcely cleft to the fore angle of the eye, and smooth.

The wings are of very moderate length, but of great and pretty uniform fulness or breadth: the tertiaries and primaries equal: first and second primaries considerably and subequally gradated: third and fourth nearly equal. Fourth longest: first not bastard; more than half as long as the fourth.

The tail is rather long, and is composed of twelve very firm, broad, and equal feathers. The tarsi are very low: knees and more plumose: acrotarsia scaled: paratarsia smooth: toes long and typically syndactyle; the soles being quite flat, and the exterior toe joined to the central fore as far as the second joint—the interior, as far as the first.

Nails subequal, much compressed, falcate, feeble, and acute: the central fore with a large unpectinated comb. From the chin to the breast depends a row of plumes, inserted opposite to each other on either side the trachea. They are more than two inches long, of composed web, and medial equal breadth. Their mobility gives the living bird a very grotesque appearance. Some such appendage seems to distinguish one of the true bee-eaters, viz. that called *amictus*.

These birds feed principally on bees and their congeners: but they likewise consume great quantities of scarabæi and their like. They are of dull staid manners, and never quit the deepest recesses of the forest.

In the Rája's shooting excursions they are frequently taken alive by the clamorous multitude of sportsmen, some two or more of whom single out a bird and presently make him captive, disconcerted as he is by the noise. It may be worth while to add, in conclusion, that the true bee-eaters are never seen in the mountains: nor the *Buciæ* ever, I believe, in the plains. The intestinal canal in our birds is usually about twelve inches long, with cæca of an inch and more in length, placed near to the bottom of it. The stomach is muscular, and of medial subequal thickness. Such, too, is the character of the stomach and intestines in *Merops*.

VII.—*On a new Piscatory Genus of the Strigine Family.*—*By the same.*

Order Raptores. Family Strigidæ.

Genus new. *Cultrunguis*, Mihi.

Generic character :—

Bill subequal to the head, straightened as far as the cere, gradually curved beyond it, moderately compressed, strong. Wings medial, equal to the tail, four and five longest and subequal; three first considerably gradated, first not pectinated. Tarsi rather elevate, partially or wholly nude, reticulate. Toes nude, and reticulate with three or four scales next the talons; the anteriors subequal. Talons medial, stout, subequal, compressed, cultrated below*. Egrets as in *Bubo*, disc and ears as in *Noctua*. Tail short.

It is some time since Gen. Hardwicke made known to science an owl with nude tarsi†. The circumstance was remarkable, but it does not seem to have led him to any further investigation. Some years back I discovered a similarly-characterised species, and at the same time noted that the talons were sharpened like a knife on their lower edge. In process of time I discovered another species with the tarsi half naked; and this also had cultrated talons. But my specimens of both species happened to have the stomach empty; and I had no immediate means of observing the manners of the birds. In 1830 I had opportunity to note that both species flew well by day, and were constantly found on the banks of rivers. Analogy with the eagles then led me to suspect that these birds might possibly be fishers: but still, until I had seen them fishing, or had obtained specimens with fish in the stomach, I could have no safe ground for assuming so extraordinary a fact. I have now, however, procured specimens with the stomach full of fish, and fish only‡; and I presume that the *expost-facto* inference from structure to habits will scarcely be questioned. Whether Hardwicke's owl will, when better known, constitute another genus of the fishing owls, remains to be proved: but that bird is sufficiently distinguished from either of mine by its shielded tarsi. In forming a new genus for two new species, essentially alike, and very materially differing both in conformation and habits from all known birds of this family, I rely upon the sanction and support of men of science. And I shall only add, before proceeding to give the specific characters, that those of the genus have been derived from a freer use of ordinary external characters than has heretofore been made in

* Hence the generic name, *cultratus* and *unguis*.

† Of the yet earlier *Strix nudipes* of Daudin, nothing seems accurately known.

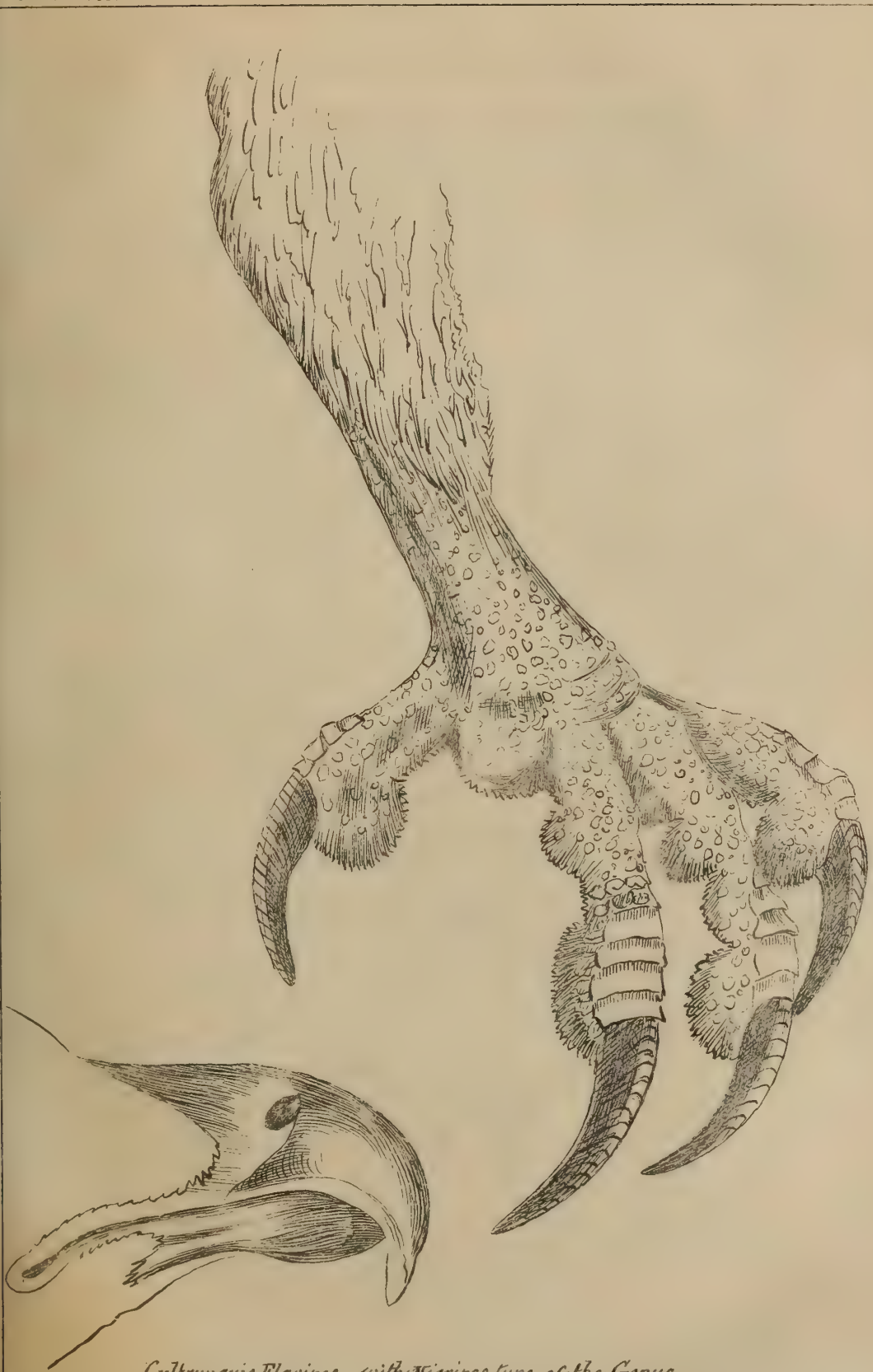
‡ I have just discovered that they prey on crabs as well as common fish. B. H. H., 2nd July, 1836.

respect to the Strigine birds. CUVIER regarded these birds as constituting but one genus. VIGORS raised this genus to the rank of a family, advancing CUVIER's subgenera to genera. But VIGORS left CUVIER's character as he found them,—whether wisely or not, I shall not presume to say. I suspect, however, that, as species multiply and become accurately known, resort will be had to characters analogous to those by which the Diurnal Raptores (to go no further) are generically distinguished, if not from a sense of the superficialness of the old characters, yet from a want of determinate new ones. It is surely reasonable to distinguish all the *Raptores* upon similar principles; and, as the external construction of the Strigine birds certainly renders this quite practicable, so, I believe, that the analogies thus necessarily suggested to the student between them and the Falconidæ, would tend to the higher uses of the science.

First species: *C. Flavipes*, yellow-footed Cultrunguis, Mihi. Head, neck and body below, bright rusty, each plume striped down the shaft with saturate brown; the stripes narrower below than above: disc and leg-plumes immaculate: back wings and tail, saturate brown, transversely barred, and largely emarginated and tipt, with rusty; the bars interrupted on the shafts, and frequently resembling triangular indentations: four bars across the great quills and tail feathers; and the tips of both largely paled: plumes of the thighs and tarsi downy: half the latter nude: nude portion and the toes, flavescent fleshy grey: talons horn yellow: bill blue, with a dusky tip: iris bright yellow: edges of eye-lids black: twenty-two to twenty-three inches long by 55 to 58 wide. Weight three and a half lbs.

N. B. The sexes resemble each other both in size and colours.

Second species: *Cultrunguis Nigripes*, Mihi. Head, neck, back, and whole body below, pale earthy brown, with a fawn tinge; paler and albescent on the abdominal surface; each plume striped down the shaft with a saturate brown mark, which is narrower below than above; and each also crossed with numerous slender zigzags of brownish fawn colour: wings and tail saturate brown, triangularly indented or cross-barred, and broadly tipt, with obscure rufous yellow, which is freckled, for the most part, on the tertiaries, and scapulars, with brown: great quills and rectrices, quadricinctate, as in the preceding: disc earthy brown: thighs pale fawn: both immaculate: throat white, and almost or wholly unmarked: wings albescent towards the roots of the feathers: bill dusky horn: iris bright yellow: edge of eye-lid black: tarsi and toes, purpurescent dusky: talons the same, with black points: thighs and knees to the front, covered with downy plumes: tarsi and toes, nude: size of the last.



Cultrunguis Flavipes _ *with Nigripes type of the Genus Cultrunguis*

N.B. inner side of the foot : size of nature.

J.B. Tassin's Lith^c Press. Calcutta.

N. B. This species bears an extreme resemblance, in point of colours and size, as in other respects, to the *Strix Hardwickii*. But it may be at once distinguished therefrom by its reticulated tarsi.

The sexes, as in the preceding species, are alike both *in size* and colours. These birds moult once a year, between June and October, inclusive; they breed in February-March; and are almost equally common in the several regions of Nepál, notwithstanding the great diversity of climate.

The structure of their stomach and intestines offers no marked peculiarity. The intestinal canal is from three and half to four feet long; very thick-coated throughout; considerably wider above than below; and furnished with two thin cæca, from three to four inches long, which are situated near the anal extremity of the canal, and widened considerably at their distad end.

The stomach is rounded, considerably and equally thickened in its coats, and provided with a toughish and rugose lining, which is easily separated.

The coats do not consist of proper muscle, but of a substance between gland and cartilage; for which I know no name, commonly as it occurs. The succentorial stomach is purely glandular, with soft papillated lining, not distinguishable from the body of the organ; the points of the papillæ being, in fact, mere excretory pores directly in contact with the secreting substance.

The following detail of dimensions is taken from a male specimen of *Flavipes:* but so similar are the two species, and the sexes of both, that it will equally represent the average size and proportions of the males and females of both species.

	ft.	*in.*	
Tip bill to tip tail,	1	10	
Bill, length of,	0	2	
—— basal height of,	0	1	$\frac{3}{8}$
—— basal breadth of,	0	1	$\frac{4}{8}$
Tail,	0	9	
Tarsus,	0	3	$\frac{1}{2}$
Central toe,	0	2	$\frac{1}{4}$
Expanse of wings,	4	10	
Weight,	$3\frac{1}{2}$lbs.		

VIII.—*Report of the Society of Arts on Specimens of Rice, Wool, &c. from Nepál and Assam.*

[Communicated by Government.]

The Society having received from their Committee of Colonies and Trade a report on sundry articles sent to them for examination from

the Honorable Court of Directors of the East India Company, have been pleased to approve the same, and have directed their Secretary to transmit a copy of the Report forthwith to the Honorable the Court of Directors, with an assurance that the Society will at all times be happy to receive from them any communications connected with the objects of this Society.

(Signed) ARTHUR AIKIN, *Secy.*

REPORT.

The Committee of Colonies and Trade having been directed by the Society to examine sundry articles sent to the Society by the Honorable the Court of Directors of the East India Company, and referred to this Committee 4th November, 1835, report as follows :

I. The Soomla or Himalaya paddy, or mountain rice, received from Mr. HODGSON, Resident at Nepal, appears to be of the same kind as a sample (comprising five varieties) sent to the Society of Arts in 1821, by Dr. WALLICH.

From the great height above the level of the sea at which this grain is cultivated in Nepal, it is suggested that it may perhaps be advantageously introduced as an agricultural crop in the North of Europe.

Before this can be determined in the affirmative, it is necessary to prove, first, that this grain is capable of coming to maturity in the climate of the North of Europe ; and, secondly, that the clear profit of a crop of hill-rice from a given area shall be at least equal to that of a crop of oats, barley, or rye from the same area.

Several parcels of the former quantity of hill-rice were distributed by the Society to persons residing in various parts of England ; and several were likewise sent to France, to Switzerland, to Germany, and to Russia. Of those sent to the Continent, the Society has received no intelligence ; and of those distributed in England, the result has been, with one exception, that the seeds did not germinate. A notice likewise was inserted in one of the French journals a few years ago, from which it appeared that various attempts had been made to grow the hill-rice of Nepál in some of the districts of France from seed distributed by the Government of that country, but wholly without success.

Mr. ANDERSON, the Curator of the Apothecaries' garden at Chelsea, was one of those who undertook to make an experiment on the possibility of growing the hill-rice in England, and was, in consequence, furnished with some seeds of the five varieties at that time in the Society's possession. They were sown in March, and some of each kind germinated and did very well while they were kept in the

hot-house. In May they were removed to the green-house, where they became stout, healthy plants. In the end of June they were transferred to a sheltered place in a basin for the growth of aquatic plants, having nine inches depth of water and twelve of mud; here they grew and promised well till the beginning of August, when, the weather becoming cloudy and rather cold, they became sickly, and were all dead by the beginning of September without having come into flower. It seems, therefore, evident that the temperature even of the warmer parts of England is not sufficient for the successful cultivation of hill-rice.

The latitude of Sirinagar, where this grain is cultivated, is about 30° ; that is, under nearly the same parallel as Cairo ; and although, from its height above the sea and its vicinity to ridges of snowy mountains, the winters are severe, yet in such situations the summers are much hotter than on lower levels in higher latitudes, where the average temperature of the whole year is not perhaps greater than that of the middle of one of Europe. In Florence, and even in Rome, frost and snow are by no means of unfrequent occurrence in the winter, and yet the summers are hot enough to bring to perfection many annual vegetable products, rice among the rest, which will not succeed north of the Alps.

Concerning the second head of inquiry,—viz. the comparative profit of land cropped with hill-rice, and with barley or oats,—the Committee are not in possession of a single fact on which to found an opinion. But they may be allowed to state that, as the farinaceous food of Europeans is consumed chiefly in the form of bread or of cakes, and as rice is not capable of being made into either one or the other of these preparations by the simple process of kneading with cold water and then baking, either an additional process of cooking would be necessary in the attempt to substitute rice for the ordinary European grains, or the new habit must be superinduced, of doing without bread and replacing it by boiled rice.

In order to obtain a correct opinion of the comparative value of hill-rice with the other qualities of this grain in the London market, a sample was sent to Mr. Ewbank for examination. That gentleman reports that fine Carolina rice, imported in the state of paddy and cleaned here, is worth 30 shillings per cwt. ; that fine Bengal rice cleaned here, is worth 23 shillings per cwt. ; that rough and inferior East India rice, imported half-cleaned and finished here, is worth 14 shillings per cwt. This latter was purchased from the importer at eight shillings, lost 20 per cent. in cleaning, and the cost of this process was two shillings per cwt. ; so that there remained only two shillings per cwt. for interest, profit, &c.

The hill-rice is nearly of the same quality as the latter kind, being dark coloured, opaque, and not at all calculated for the English market.

The opinion, therefore, of the Committee is, that the hill-rice cannot be successfully cultivated in Europe; and that, if capable of being so cultivated, it could not enter into competition in the European market with Bengal rice.

II. The wool of the Hooniah sheep of Tibet consists of two samples,—one, of the wool in its natural state; and the other, of a portion from which the black hairs have been separated.

The former is of precisely the same quality as a parcel sent last year (1834) to the Society by Dr. WALLICH; and the market price of it in London, at that time, was, according to Mr. EBSWORTH, of Basinghall Street, from 10 to 11 pence per lb.

The two samples, after being examined by the Committee, were also examined by Mr. EBSWORTH, and by Mr. SOUTHEY, of Coleman Street.

According to Mr. EBSWORTH, the value of the wool in its unsorted state is from five to seven pence per lb. A considerable quantity of similar wool from India, but rather coarser, has been sold in the London market during the last two years at from two and half to seven pence per lb. The sorted wool is worse than the unsorted; for, in separating the dirt, all the finer filaments have likewise been taken away.

Mr. SOUTHEY estimates the value of the unsorted wool at about 10 pence per lb.; and states, that it greatly resembles a large portion of the wool imported from Jutland and Denmark.

Mr. HODGSON's expression that the "wool is said to be superb," does not in the least apply to the sample actually sent by him; but as he has stated that the animal "is of trans-Himalayan origin, and will not bear the heats of Nepál*," it seems probable that the wool in question was grown in that country, and has greatly degenerated; it being well known that the sheep of Barbary produce hair rather than wool.

The Committee think it incumbent on them to notice an opinion expressed by Mr. SOUTHEY, from the great attention which that gentleman has paid to the growth of wool; namely, that the Hooniah and other coarse qualities of Indian wool, of which many hundred bales have recently been imported, would be very materially improved by the introduction of some well-selected rams, of which an ample supply might no doubt be obtained from New South Wales.

* This expression completely confirms the observations previously made respecting the hill-rice of Nepál, which thus seems to grow in a climate too hot for the production of wool.

III. Two large pieces of cloth made from the down of the Simool or Tree-Cotton, *Bombax heptaphyllum*, from Gowahatty in Assam, the place of their manufacture.

On examining the cloth it appears that the fine short down of the *Bombax* has been spun into a large wove slightly twisted cord or roving, and that this is made into cloth by interweaving it with a warp and short of common thin cotton-thread, much in the manner of carpeting. It composes a loose cloth, incapable, probably, of being washed without injury, but considerably warm, very elastic, and light.

From the shortness of the staple and the great elasticity of the fibre, it is not at all probable that it could be spun by the machinery now in use for spinning cotton; but the combination which it exhibits, of fineness of fibre with great elasticity will, no doubt, make it rank high as a non-conductor of heat, and therefore fit it for making wadding, and for stuffing muffs, and perhaps mattresses. When carded with wool it might probably form the basis of fabrics of great warmth, lightness and silky softness.

IV. Sample of Safflower made at Myrung in Assam, by Lieut. Rutherford.

The Committee not wishing to rely entirely on their own judgment in this case, more especially as the whole quantity placed at the disposal of the Society is not enough for a satisfactory comparative trial either on silk or on cotton, have availed themselves of the opinion of several dyers and brokers, the concurrence of whose judgment with that of the Committee induces them to consider it as correct.

Mr. Grieve, silk dyer, of Booth Street, considers the sample to be clear and of good quality.

Messrs. Racine and Jaques, silk dyers, of Spitalfields, consider the sample to possess a fair proportion of colour, though not of equal quality with the best from Bengal.

Messrs. Johnson and Renney exhibited to the Committe samples of safflower from different places and of various qualities. They stated that the best Indian comes from Dacca, of which there are two varieties, one from Paturaghauta, and the other from Billespour; the former of which is the more valuable to the amount of about 20 per cent.

Mr. Renney stated, that during his residence in India he paid much attention to the preparation of this dying drug. The time for gathering the flowers is near the end of the dry season, when the tanks are almost exhausted; in consequence of which, the water employed to wash the safflower is generally muddy and swarming with animalculæ: hence it happens that the cakes, though packed in

close boxes, are often more or less injured by worms ; which injury he conceives would be greatly diminished by substituting clean spring water for that of the tanks. The sample before the Committee is fair and clean, and suitable for the market, and is worth about £ 7 a cwt.

The finest safflower of all comes from China, but is not an article of regular appearance in the market. The comparative value of it is as high as £ 30 per cwt.

Mr. EMLEY, drug-broker, and a Member of the Committee, considers the sample to be of good fair merchantable quality, and in value as stated by Messrs. JOHNSON and RENNEY.

V. Two skeins of fibre made from the leaves of the wild pine-apple, and two net bags made of the same material, sent from Gowahatty in Assam, by Captain JENKINS.

The sample is not sufficient for any fair comparative trial of its tenacity.

The Society are already in possession of fibre from the leaves of the black Antigua pine and from the Penguin pine of Jamaica, which latter is occasionally made into ropes in the West Indies, but is not the object of any regular manufacture, the expense of labour in those colonies rendering it more advantageous to import from England cordage ready made. It appears likewise (from BURNETT's Wanderings in New South Wales, &c. vol. ii. p. 207), that at Singapore the Chinese settlers obtain fibre from the leaves of the wild pine-apple, which fibres are exported to China, where they are employed as a material for linen. Also in the Journal of the Asiatic Society of Bengal, for January, 1832, is a paper by Lieut.-Col. WATSON on Chirra Punji, the sanatory station recently occupied by the East India Company, in which it is stated, p. 27, that the pine-apple plant flourishes in great abundance in the adjacent valleys, 4,200 feet above the level of the sea, and that the leaves are gathered by the natives for the purpose of obtaining from them, by a very simple process, a strong fibre, which they employ as the material of the net pouches or bags in common use among them.

From these indications it would perhaps be worth while for the Court of Directors to have a quantity of the fibre imported, sufficient for a fair comparative trial with hemp and flax.

IV. Sample of the wood of the Nipal Privet, Ligustrum Nipalense, from Mr. HODGSON.

A specimen of this wood was found among those sent to England by Dr. WALLICH, and of which a catalogue is published in the 48th vol. of the Society's Transactions. It appearing to Mr. AIKIN, the

Secretary, when drawing up the catalogue*, that the specimen referred to promised to be useful to engravers on wood, it was accordingly put into the hands of Mr. Branston, who reported very favorably respecting it. That specimen was a piece of a bough or trunk a few inches in diameter, and had been taken sufficiently high above the root to be of a perfectly uniform texture. The present sample, from its broad irregular rings, appears to have been cut as near as possible to the root, in order to get it of the greatest size: but, in so doing, the uniformity of texture absolutely necessary to fit it for use by the engraver has been wholly overlooked, and the result is a sample perfectly worthless for the object for which it is intended.

By order:

(Signed) Arthur Aikin, *Secy.*

IX.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 6th July, 1836.

The Rev. Dr. Mill, Vice-President, in the chair.

Captain R. Lloyd, I. N., Dr. D. Stewart, and Dr. McClelland, proposed at the last meeting, were ballotted for, and elected members of the Society.

Mr. Wm. Speir was proposed by Mr. J. Prinsep, seconded by Dr. Mill.

Sergeant Dawe, of the Delhi Canal Establishment, proposed as an associate member by Mr. J. Prinsep, seconded by Dr. Pearson.

Read a letter from Wm. Mackenzie, Esq., stating that, in consequence of the pressure of business, and other indispensable engagements, he was obliged to retire from the Society.

Read a letter from Charles Konig, Foreign Secretary to the Royal Society, acknowledging the receipt of the Journal, and Index As. Res.

The following circular, enclosed in the above, was read and directed to be printed for general information:—

Royal Society of London, Somerset House, Nov. 19, 1835.

Sir,

I am directed by His Royal Highness the President and Council, to acquaint you, for the information of the Asiatic Society of Bengal, that His Majesty the King has been pleased to grant two Gold Medals, of the value of Fifty Guineas each, to be awarded by the Royal Society on the day of their Anniversary Meeting in each succeeding year, for the most important discoveries in any one principal branch of Physical and Mathematical knowledge.

His Majesty having graciously expressed a wish that scientific men of all nations should be invited to afford the aid of their talents and researches, I am accordingly directed by the Council to announce to you, Sir, that the Royal Medals for 1838 will be awarded in that year, the one to the author of the most important unpublished paper in Chemistry which may have been communicated to the Royal Society for insertion in their Transactions, after the present date and prior to the month of June in the year 1838;—the other, to the author of

* See Journal As. Soc. II. 182.

the most important unpublished paper in Physics, which may have been communicated to the Royal Society for insertion in their Transactions, after the present date and prior to the month of June in the year 1838.

I have the honour to be,
Sir,
Your very obedient humble servant,
CHAS. KONIG, *For. Sec. R. S.*

To JAMES PRINSEP, Esq.
Secretary of the Asiatic Society of Bengal, Calcutta.

Read a letter from H. T. PRINSEP, Esq. Secretary to the Government of India, General Department, intimating that the Right Honorable the Governor of Bengal had been pleased to empower the Curators of the Public Library to make over to the Society the Oriental books printed in Europe, on the same conditions, with the manuscripts and works already transferred from the College of Fort William. The Secretary stated that he had in consequence received charge of three hundred volumes—some few being, however, duplicates of works already in the library.

A letter from the Civil Auditor, desiring to be furnished with an abstract of the establishment entertained for the care of the Government Oriental Works. Understanding the 78 rupees monthly to be a consolidated allowance, in which case no detail of its expenditure need be furnished, Resolved to make a reference on the subject to Government.

Library.

Read a letter from H. T. PRINSEP, Esq. Secretary to the Government of India, forwarding on behalf of the Honorable the Court of Directors for presentation to the Society, a copy of the Catalogue of Stars in the Southern Hemisphere, by Lieut. Johnson, H. C. Ast. at St. Helena.

Read a Persian note from MANU LAL, presenting a copy of a compilation from standard Persian and Hindustaní Poets, published by himself under the name of *Guldesteh í Nishát*,—The Nosegay of Pleasure.

Read a letter from Kumar RADHACANTH DEB Behadur, forwarding for presentation to the Society a copy of his great publication, entitled *Sabda Calpa Drama*, an Encyclopedical Lexicon in Sanscrit, vols. 1, 2, and 3. The subsequent or the remaining vols. will be forwarded when published. Also translation of an extract from a Horticultural work in Persian, printed by the Roy. As. Soc. of London.

A volume of selected papers of a literary nature published in the Government Gazette while Mr. WILSON was Editor, was presented by *Mr. James Prinsep.*

Meteorological Registers for April and May 1836, were presented by the *Surveyor General.*

Museum.

Read a letter from Prof. GOODEVE, Secretary to the Medical and Physical Society, requesting the Society's acceptance of a pair of glazed almirahs, their contents having been transferred to the Medical College.

Two large chatta-hats from Assám, were presented by *Dr. W. B. Davis.*

Various rude specimens of domestic implements from New Zealand, by *Mr. H. T. Prinsep.*

Literary and Antiquities.

Read a letter from R. D. Mangles, Esq. Secretary to the Government of Bengal, Judicial Department, transmitting on behalf of the Right Honourable the Governor of Bengal, a Census of the population of the town of Gyah and its suburbs, framed under the superintendence of Mr. Hathorn, the Magistrate of *Behar*.

A note on the origin of the Armenian era and the reformation of the Haican Kalendar, by *Mr. Johannes Avdall*.

Read a letter from L. Wilkinson, Esq. Agent at *Bhopal*, forwarding the copy of an inscription on a copper-plate lately found at Piplianagar in the Shujal Perganah, by a krisan, or husbandman, in ploughing; with an English translation.

Read a paper by Major Lloyd, on the sacred silken vests of the Tibetan priests, alluded to in Turner's Embassy. They are adorned with images, and have a lettered border of sacred texts woven into the scarf: one of these had been submitted to Mr. Csoma de Körös, and by him translated.

[This note will be printed in our next.]

Mr. Hodgson forwarded an amended list of the Sanscrit Bauddha works procurable in Nepál. Such as have been sent home to Paris or London, were noted by an asterisk.

Physical.

A note on the progress of the boring in Fort William was read by Capt. Taylor, Town Major. [Vide infra.]

A memorandum of a well sank in the Chandpur bunds, near the foot of the Sewalík range, was likewise communicated by Lieutenant Baker, Engineers.

A descriptive catalogue of part of the Society's collection of Silhet shells, was received from Mr. W. H. Benson, M. A. S.

[Printed in the present number.]

A letter from Lieutenant Geo. Fulljames, giving further detail of the fossil discoveries at Perim, and announcing the despatch of specimens for the Society's museum.

[As this letter arrived while the Baron Hugel's note was in the press, the interesting particulars it contained were appended to that paper; see last No. p. 290.]

Mr. B. H. Hodgson transmitted 27 further specimens of his Illustrations of Nipálese Zoology; also papers,

On three new genera of thrush.

On three new species of woodpecker.

Dr. W. Cantor submitted his sketch of an undescribed hooded serpent with fangs and maxillar teeth, accompanied with coloured drawings on a large scale.

Dr. N. Wallich presented two papers on new genera of plants, by Dr. Griffiths, to which the author has given the names of Bucklandia and Sedgwickia.

[These will be inserted in our next.]

Presentations to the Museum of Natural History.

Specimens of the great-eared owl, *(Bubo Macrocephala ;)* Flammeous Fly-catcher, *(Muscicapa Flammea ;)* Gurial King-fisher, *(Halcyon Gurial;)* black-headed Oriole, *(Oriolus Melanocephalus ;)* Bengal woodpecker, *(Picus Bengalensis;)*—Woodpecker, *(Picus Macei ;)* skulls of Hornbill, *(Buceros Homrai ;)* and Pelican, *(Pelecanus Onocrotalus,)* and skin of the Amethystine Python ; presented by *W. B. Davis, Esq.*

Specimens of Silky-throat Ráyá, *(Raya Sericeo-gula ;)* Nepal Bucia, *(Bucia Nepalensis;)* black-headed Sibia, *(Sibia Nigriceps ;)* Picaoid Sibia, *(Sibia Picaoides;)* and blue-winged Chloropsis, *(Chloropsis Cyanopterus ;)* presented by *B. H. Hodgson, Esq.*

The above are specimens of new genera, instituted by Mr. HODGSON ; papers on which he has favored the Society with ; and the specimens will be figured in his great work on the Fauna of Nepal.

Specimens of white eye-browed Jacana, *(Parra Superciliosa,)* and Girra Teal, *(Anas Girra,)* presented by *W. C. Smith, Esq.*

The internal ear of the Whale, presented by *H. T. Prinsep, Esq.*

Specimens were exhibited of Birds from Almorah, mounted in the Museum ; and an articulated skeleton of the Adjutant, also prepared there.

On the conclusion of the ordinary business of the meeting,

A letter was read from the Most Rev. the Bishop of Cochin China, (who was present at the meeting) resubmitting a proposition for the publication of his Anamitan Dictionary, and stating that in an interview with the Governor General, he had been empowered by his Lordship to renew his application to Govt. through the Secretary of the Society.

The favorable recommendation embodied in the report of the Committee of Papers last year, was qualified on one point—namely, in as much as the specimen of the work then before them wanted the Chinese character, which was deemed essential to its perfection as a literary work. This was now removed, and the Bishop was present, and ready to engage for its correct insertion : he would also engage, should it be determined to publish in lithography, to write, or superintend and correct, the whole of the work on transfer paper, for the consideration of 4,000 rupees. The paper and printing might cost about 1,200 more. On these new grounds it was agreed that there would be no disrespect in submitting a second application to Government in favor of the proposition, which the Secretary was requested to prepare.

Note on the Progress of the Boring in Fort William. By Captain TAYLOR, M. A. S.

In laying before the Society the accompanying section* and specimens of the strata found in the recent operations carried on in Fort William for the discovery of a spring of pure water, it may be expected that I should give some account of the progress and state of the experiments; I therefore beg to offer the following observations.

* We postpone this until the operations, hitherto so successful, may have been brought to a close.—ED.

A detail of the early part of these operations, which commenced in October last, would comprise little besides a narrative of difficulties barren of facts scientifically interesting. It will be sufficient briefly to state, that in the first attempt a depth of 136 feet only was attained by boring; when the same quicksand which in every case seems to have baffled General Garstin's efforts to proceed, put an end to this also.—The tubes, without support in the loose sand, separated in several places, and fell out of the perpendicular; all attempts to rejoin or recover them failed.

As the same strata, and consequently in so much as that is concerned, the same difficulties might be expected to occur in boring in any part of the alluvial formation of the delta of the Ganges, it was not supposed that any material advantage would be gained by changing the site of operations; it was resolved to proceed with a second attempt in the immediate vicinity of that where we had just failed.

On the 28th of April another shaft was commenced; experience had suggested several improvements in the arrangement of the machinery, and taught us to use the tools with better effect. The improved skill of the workmen was made manifest by the fact, that the depth of 126 feet, which in the first attempt occupied forty-seven working days to attain, was now reached in eighteen with ease and facility.

So far the strata passed through, corresponded precisely, in their order at least, with all that had occurred on former occasions. The same quicksand which caused the abandonment of the first attempt was reached at 120 feet; and at this point our difficulties commenced. To obviate the disaster which had rendered our labour abortive in the first instance, the tubes were secured against dislocation in the loose sand by screws at their joints; and to this precaution must be attributed the success of the work so far. The sand alluded to is of so loose, I may say, semifluid a character, that on the removal of a portion of the water which stands in the tube to 15 feet from the surface, it immediately rose 17 feet; and although at this time the work was prosecuted night and day without any intermission, the sand rose faster in the tubes than it could be removed; so that at the end of eleven days and nights of incessant toil it had risen from 124 to 103 feet.

Hence it became evident that the only mode of overcoming the obstacles presented by the sand was to force the tubing down, until coming in contact with some firm stratum, the sand should be excluded. By unrelaxing perseverance and much labour, frequently gaining but a few inches in the day, the tubes at last attained a depth of 157 feet. The sand was gained upon; at 152 feet it was observed to become darker in color and coarser in grain, containing a quantity of what appeared to be small pieces of iron ore*. At 159 feet a stiff clay with yellow veins occurred, resembling in appearance a thin stratum passed at 127 feet. The borer, which during the prevalence of the sand was always behind the tubing, sometimes several feet, now penetrated in advance of it, and in less than 24 hours reached the depth of 175 feet.

The clay at 163 feet changed, for a short space, remarkably in color and substance; becoming dark, friable, and apparently containing much vegetable and possibly some ferruginous matter. At 170 feet it became sandy, and gradually passed into a very coarse sharp sand mixed with small fragments of quartz and felspar, which was brought up from 175 feet.

This gravel or shingle at present impedes further progress, until we shall have made some auger capable of penetrating and lifting the stones.

* Red waterworm nodules of hydrated oxide, like the laterite of South India.—Ed.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of June, 1836.

Day of the Month.	Observations at 10 A. M.									Observations at 4 P. M.										Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Wet Barometer at 32°.	Difference.	Thermometer in air.	Wet-bulb Thermom.	Leslie's Dif. Hygrom.	Dew point at 9 A. M.	Hair Hygrometer.	New Stand. Barometer red. to 32°.	Old Stand. Bar. at 32°.	Wet Barometer at 32°.	Difference.	Thermometer in air.	Wet-bulb Thermom.	Leslie's Dif. Hygrom.	Dew point at 2 P. M.	Hair Hygrometer.		Cold on roof.	Heat in sun on roof.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	4 P. M.
1	29,497	,543	28,974	—,569	88,4	5,9	4,8	75,4	93	29,379	,423	28,802	—,621	92,6	9,6	7,9	74,8	86		70,0	96,2	0,20	S.	sw.	sw.	cum.	overcast.	fine nr. at nt.
2	,524	,565	,989	,586	88,5	7,5	6,0	75,4	88	,407	,459	,806	,653	93,1	10,9	8,7				68,0	98,9	,45	SE.	se.	sw.	do	cumuli.	misty. do
3	,589	,630	29,069	,561	87,0	6,4	5,3	75,6	93	,479	,531	,872	,659	93,8	13,2	11,5	73,6	79		68,8	100,8		se.	ssw.	s.	do	cum. str.	fine do
4	,601	,648	,062	,586	88,5	7,1	5,6	75,0	92	,475	,529	,844	,685	94,5	12,3	10,0	75,6	82		72,1	102,0		se.	se.	s.	clear.	do	misty.
5	,563	,590	,008	,582	89,4	8,8	7,0	75,0	88	,443	,495	,838	,657	91,7	9,4	7,6	76,4	86		77,4	98,9		S.	se.	se.	cum.	cumuli.	hazy.
6																				81,2	98,0		sse.			cirri.	do	
7	,477	,520	28,904	,616	90,7	6,9	5,6		91	,372	,428	,768	,660	94,2	9,6	10,0		82		81,8	100,0		S.	sw.	sw.	cum. strat.	cu. stra.	fresh breeze.
8	,497	,537	,932	,605	90,1	6,5	5,4		92	,406	,453	,796	,657	92,9	8,5	6,5		89		82,1	91,0		S.	sw.	sw.	cum.	cum.	do
9	,487	,528	,906	,622	90,8	6,4	4,9		91	,385	,433	,784	,649	93,4	7,1	5,5		84		81,0	92,0		S.	sw.	se.	c. cum.	blowingfresh	fine.
10	,515	,552	,936	,626	90,5	8,7	7,4	78,5	86	,428	,468	,818	,650	94,8	9,2	6,2		87		82,0	98,7		SSW.	SW.	sw.	strong wind.	cumuli.	do
11	,594	,625	29,019	,606	90,3	7,1	7,0	77,7	89	,469	,514	,866	,648	90,3	8,9	6,7	76,0	87		82,0	—		S.	SW.	S.	do cl.	cum. cirri.	storm. nwr.
12	,636	,666	,103	,558	87,9	7,4	6,6	74,6	89	,562	,542	29,324	—,218	95,1	11,3	dry	76,0	83		72,2	—	1,70	o.	S.	S.	cum. str.	storm.	fine rn.
13	,567	,596	,405	—,191	86,5	5,1	4,5		93	,452	,492	,299	,193	88,4	7,8	6,2	70,8	88		72,0	99,6		S.	S.	W.	heavy rain.	cum. cirri.	nimby.
14	,526	,568	,372	,196	86,0	6,0	5,5		91	,426	,472	,288	,234	92,6	10,3	9,7	70,7	81		81,0	102,4	,35	s.	w.	sw.	cir. cum.	overcast.	cum. str.
15	,550	,590	,383	,207	86,6	4,0	3,8		95	,461	,507	,290	,217	87,9	6,3	6,0	75,5	89		78,0	105,3		s.	sw.	NE.	do	cumuli.	hazy.
16	,583	,623	,411	,202	88,9	6,5	6,2		88	,483	,525	,314	,211	87,8	4,6	5,0	75,7	92		78,2	110,0		s.	e.	se.	do	cum. str.	threaty,
17	,605	,628	,441	,187	87,6	3,4	4,0	78,0		,484	,516	,330	,186	83,4	3,2	4,0	77,0			78,8	87,2		sw.	sw.	se.	cu. strat.	do	cloudy.
18	,583	,594	,460	,134	80,8	2,3	2,5	76,0		,454	,485	,304	,181	86,1	4,5	5,9	76,3			76,8	88,0		se.	sw.	se.	cir. cum.	do	do
19	,558	,576	,390	,186	87,3	3,9	6,1			,482	,514	,330	,184	86,7	3,4	4,4	76,6			74,8	106,4		S.	s.	sw.	do	fine.	threaty.
20	,603	,634	,450	,184	86,9	2,3	5,1	76,7		,486	,524	,320	,204	87,6	6,6	5,4	76,5			77,7	107,2	,30	sw.	S.	sw.	cum.	cum. strat.	do
21	,537	,611	,430	,181	87,8	3,3	6,1			,467	,500	,294	,206	88,7	8,1	6,0	77,0			75,8	109,1		w.	SW.	se.	do	cumuli.	cloudy.
22	,528	,561	,368	,193	87,1	5,5	4,4	76,3		,381	,428	,224	,204	89,7	dry	8,0	78,5			76,8	118,7		o.	wsw.	se.	do	cum. strat.	do
23	,497	,534	,324	,210	88,8	8,8	8 0	74,8		,360	,400	,190	,210	91,3	7,3	7,0	77,5			77,8	110,5		o.	W.	ne.	do	cumuli.	cir. cum.
24	,477	,523	,294	,229	88,7	7,2	7,2			,341	,395	,146	,249	93,9	10,9	10,0				76,8	102,0		n.	se.	ne.	cirri.	do	threaty.
25	,411	,456	,220	,236	90,5	7,8	6,3		89	,321	,355	,140	,215	89,2	4,6	4,4	78,5	94		77,5	100,3	,10	E.	ne.	ne.	do	cum. strat.	showery.
26	,352	,378	,192	,186	84,9	4,3	3,8		94	,228	,267	,060	,207	85,5	5,7	4,2	77,0	94		76,2	90,0	,20	ne	ne.	NE.	nimbi.	cirrus	do
27	,266	,302	,118	,184	83,9	3,2	2,3	77,4	96	,255	,295	,108	,187	81,2	5,1	3,3	77,3	94		75,0	92,4	1,15	E.	NE.	ene.	rain. gale.	showery.	do
28	,495	,527	,358	,169	84,6	3,8	2,8		97	,428	,459	,279	,180	84,8	3,4	2,6				74,8	90,0	,15	e.	SE.	se.	clear.	do	do
29	,522	,554	,370	,184	86 5	4,7	3,6			,418	,454	,232	,222	92,0	8,7	7,0				76,5	104,5	,05	sw.	sw.	sw.	do	overcast.	cumuli.
30	,480	,511	,312	,199	86,7	6,0	4,7			,444	,479	,286	,183	86,2	4,5	3,4	77,0			77,4	104,0		sw.	sw.	se.	cir. str.	hazy.	rain.
Mean,	29,525	,557			87,6	5,7	5,2	76,1	91	,418	,460			90,0	7,4	6,3	75,9	86		76 ,6	100,3	4,65	two fresh breezes.			rain rather backward.		

The new standard Barometer stands this month ,032 at 10 A. M. and ,042 at 4 P. M. lower than my former standard, giving the same difference between the morning and evening readings as remarked during the two preceding months.

The sulphuric acid in the "wet Barometer" had a specific gravity of 1,344 up to the afternoon of the 12th, when it was changed for a stronger acid of 1,480 sp. gr. at 90°. The tensions are taken by deducting its readings from those of the *old* stand. Bar. as should have been done last month, where a correction of + ,023 must be applied to the columns of tensions: (the sign should also have been +.) the contesimal aqueous tension of Sulphuric acid sp. gr. 1,344 (compared with that of pure acid) is therefore 44; and of sulphuric acid sp. gr. 1,48, is 19.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 55.—July, 1836.

I.—*Translation of a Támba Patra, which was found in a field of the village of Pipliánagar in the Shujálpur Parganá, by a Krisán engaged in ploughing, and presented to Mr.* L. WILKINSON, *the Political Agent at Bhopál, by the Jagirdár.*

[In a letter to the Editor of the Journal of the Asiatic Society.]

It is incumbent upon the friend of research to contribute every piece of information, however trifling, thrown in his way by accident or opportunity, by which the future researches of our successors in regard to the history and chronology of this country may be, in any degree, promoted. With this view I have thought it proper to forward to you the copy of an inscription on a copper plate lately found at Pipliánagar, in this neighbourhood. For the benefit of the purely English reader, I have added a translation, which, if found correct, you can also insert.

On referring to the Chronological Table of the rájas of Málwá, given in the number of your Journal for December 1835, I find that this plate confirms the Ujjain Inscription in regard to the order of succession of four princes.

Three other copper-plates have since been found at the same village. I have not yet had time to translate, or indeed to decipher them.

L. WILKINSON.

[This inscription does more than Mr. WILKINSON allows, for it adds four important names to the Ujjain list, below that of JAYAVARMA, (see *Chron. Tab.* 105,) and having a date A. D. 1210 to ARJUN the last of the list, it exactly fills the blank between the former prince (1143), and BIRSAL in 1220. We have no space for comments, but we offer our best thanks to Mr. WILKINSON for his valuable contribution.—ED.]

Transcript of the text in Modern Nágarí.

ओं नमः पुरुषार्थचूडामणये धर्म्माय ॥
प्रतिबिंबतया भूमेः कृत्वा साक्षात्प्रतिग्रहं ।
जगदाक्रादयन् दिग्द्विजेंद्रो मङ्गलानि वः ॥ १ ॥
जीयात्परशुरामोसौ क्षत्रैः क्षुण्णा रणाहतैः ।
संध्यार्कबिंबमेयोर्वी दातुर्य्यस्यति ताम्रतां ॥ २ ॥
येन मंदोदरीबाष्पवारिभिः भ्रमिता मधे ।
प्राणेश्वरीवियोगाग्निः स रामः श्रेयसेस्तु वः ॥ ३ ॥
भीमेनापि धृतौ मूर्द्ध्नि यत्पादौ स युधिष्ठिरः ।
वंशाद्येनेंदुना जीयात्स्वतुल्यश्च निर्मितः ॥ ४ ॥
परमारकुलोत्तंसः कंसजिन्महिमा नृपः ।
श्रीभोजदेव इत्यासीदासीमक्रांतभूतलः ॥ ५ ॥
यद्यशश्चंद्रिकोदेति दिगुत्संगतरंगिते ।
द्विषन्नृपयशः पुंजपुंडरीकैर्निमीलितं ॥ ६ ॥
ततोभूदुदयादित्यो नित्योत्साहैककौतुकी ।
असाधारणवीरश्रीरश्रीहेतुर्विरोधिनां ॥ ७ ॥
महाकलहकल्पांते यस्योद्दामभिरासुगैः ।
कति नोन्मूलितास्तुंगा भूभृतः कटकोल्वणाः ॥ ८ ॥
तस्माद्भिन्नद्विषन्मर्मा नरवर्मा नराधिपः ।
धर्माभ्युद्धरणे धीमानभूत्सीमा महीभुजां ॥ ९ ॥
प्रतिमभातं विप्रेभ्यो दत्तैर्ग्रामपदैः स्वयं ।
अनेकपदतां निन्ये धर्मोयेनैकपादपि ॥ १० ॥
तस्याजनि यशोवर्मा पुत्रः क्षत्रियशेखरः ।
तस्मादजयवर्माभूज्जयश्रीविश्रुतःसुतः ॥ ११ ॥
तत्सूनुर्वीरमूर्द्धन्यो धन्योत्पत्तिरजायत ।
गुर्जरोच्छेद निर्बंधी विंध्यवर्मा महाभुजः ॥ १२ ॥
धारयोद्धृतया सार्द्धं दधातिस्म चिधारतां ।
सांयुगीनस्य यस्यासिस्त्रातुं लोकत्रयीमिव ॥ १३ ॥
तस्यामुष्यायणः पुत्रःसुत्रामश्रीरथाश्रिषत् ।
भूपः सुभटवर्मेति धर्मेतिष्ठन्महीतलं ॥ १४ ॥
यस्य ज्वलति दिग्जेतुः प्रतापस्तपनद्युतेः ।
दावाग्निसुमनाद्यापि गर्जन्गुर्जरपत्तने ॥ १५ ॥
देवभूयं गते तस्मिन्नंदनोर्जुनभूपतिः ।
दोष्णा धत्तेधुना धात्री बलयं बलयं यथा ॥ १६ ॥

वाललीलाहवे यस्य जयसिंहेपलायिते।
दिक्बालहास व्याजेन यशो दिक्षु विजृम्भितं॥ १७॥
काव्यगांधर्व सर्वस्वनिधिना येन सांप्रतं।
भारावतरणं देव्याश्चक्रे पुस्तकवीणयोः॥ १८॥
तेन त्रिविधवीरेण त्रिधापल्लवितं यशः।
धवलत्वंदधु स्त्रीणि जगंति कथमन्यथा॥ १९॥

सएव नरनायकः सर्वाभ्युदयीशकपुरप्रतिजागरणके पिडिविडि ग्रामे समस्त राजपुरुषान् ब्राह्मणोत्तरान् प्रतिनिवासिपट्टकिल जनपदादींश्च बोधयत्यस्तुवः संविदितं यथा मंडपदुर्गावस्थितैरस्माभिः सप्तवस्वधिक द्वादश शत संवत्सरे फाल्गुणे १२३७

शुक्लदशम्यामभिषेकपर्वणि स्नात्वा भगवंतं भवानीपतिमभ्यर्च्य संसारस्यासारतां दृष्ट्वा तथाहि।

वाताभ्रविभ्रममिदं वसुधाधिपत्यमापातमात्रमधुरो विषयोपभोगः।
प्राणास्तृणाग्रजलबिंदुसमा नराणां धर्मः सखा परमहो परलोकयाने।

इति सर्वंविमृश्याट्यफलमंगीकृत्य मुक्तावसुस्थानविनिर्गताय वाजसनेयशाखाध्यायिने काश्यपगोत्राय काश्यपवत्सारनैध्रुवत्रिप्रवराय अवसाविकदेलणस प्रपौत्राय पंडितसोमदेवपौत्राय पंडित जैत्रसिंह पुत्राय पुरोहितगोविंदशर्मणे ब्राह्मणाय समस्तोपिग्रामश्चतुःकंकट विशुद्धः सवृक्षम्पलाकुलः सहिरण्यभागभोगः सोपस्करः सर्वदाय समेतः सविनिक्षेपो मातापित्रोरात्मनश्च पुण्ययशोभिवृद्धये चंद्रार्कार्णवक्षितिसमकालं यावत्पुत्रया भक्त्या शासनेनोदकपूर्व्वं प्रदत्तः तन्मत्वा तन्निवासिपट्टकिलजनपदैर्यथा दीयमान भागभोगकरहिरण्यादिकं देव ब्राह्मणभुक्ति वर्जमाज्ञाविधेयै र्भूत्वा सर्वमस्मै दातव्यं सामान्यं चैतत्पुण्यफलं बुध्वाऽस्मद्वंशजैरन्यैरपि भाविभोक्तृभिरस्मत्प्रदत्तधर्मो दायोऽयमनुमंतव्यः पालनीयश्च उक्तंच।

बहुभिर्वसुधा भुक्ता राजभिः। सगरादिभिः। यस्य यस्य यदा भूमि स्तस्य तस्य तदा फलं॥

स्वदत्तां परदत्तां वा यो हरेत वसुंधरां। स विष्ठायां क्रिमिर्भूत्वा पितृभिः सह मज्जति इति कमलदलांबुबिंदुलोलां श्रिय मनुचिंत्य मनुष्य जीवितंच।

सकलमिदमुदाहृतं च बुध्वा न हि पुरुषैः परकीर्त्तयो विलोप्याः।

संवत् १२३७ फाल्गुणशुद्ध १० गुरौ रचितमिदं महापंडित श्रीविल्हणसंमतेन राजगुरुणा मदनेन॥

Translation.

To Virtue, the most worthy object of desire to man, hail!

1. May the best of Bráhmans, who gives happiness to the whole universe by accepting a small portion of the earth as an emblem of the whole, give happiness to you.

[Or, may SHESHA, who gives happiness to the whole world, upholding (by contact with) that portion (resting on his head), give happiness to you. Or, may the moon, who gives happiness to the whole world, and who receives (in an eclipse) the shadow of the earth, give happiness to you.]

2. May that PARASHURÁMA, who gave to the Brahmans the whole earth, after it had become red as the setting sun, being drenched in the blood of the race of Cshatriyas prostrated in terrible conflicts, ever be praised.

3. May that RÁMA, who victorious in battle, quenched in the flood of tears, caused MANDODARI to shed the fire that burnt in the breast of the virtuous SI'TA, when torn from her consort, give salvation to you.

4. May YUDHISHTHIRA, whose feet the valiant BHI'MA kissed in humility, and whom CHANDRA, the founder of his race, formed wholly in his own likeness, live for ever.

5. The illustrious Rája BHOJA DEVA, formerly reigned: he was the chief of the Paramár princes, and in glory equal to the conqueror of KANSA. He traversed the earth in victory even to its ocean limits.

6. On the appearance of this glorious king, the fame of all hostile princes in all regions of the earth faded into obscurity, as white water-lilies in a ruffled lake bowing their heads submissively, lose their brightness before the world-pervading glories of the rising full moon.

7. To Rája BHOJA succeeded UDAYÁDITYA, whose constant delight was in the pursuit of pleasure: he was singularly endowed with the virtues of a hero; and stripped his enemies of their glory and fame.

8. How many proud princes with their terrible armies did not this Rája overthrow in ever-memorable battles, which resembled the war of elements in the universal deluge by the rapid discharge of his irresistible and fast-flying arrows; or he was like the whirlwind, which rising up at the universal deluge by its irresistible force, overthrows whole ranges of terrific and inaccessible mountains.

9. After him succeeded Rája NARAVARMA, who smote his enemies to death. He was wise and steadfast in support of religion and virtue: a very paragon of excellence, and a perfect model to the princes of the earth.

10. He restored to religion, who stood infirmly on one foot in this iron age of guilt, its four-fold support, by making daily grants of land to Brahmans.

11. YASHOVARMA, the chief ornament of the Cshatriya tribe, succeeded to him: and to him succeeded AJAYAVARMA, distinguished by his wealth and victories.

12. His son VINDHAYAVARMA, glorious in his life, next followed. He was distinguished for his heroism, and by his personal prowess, and directed his ambition to the reduction of the country of Guzerát.

13. The sword of this warrior assumed a threefold edge, when upraised to yield protection to the three worlds.

14. His son AMUSHYAYANA, equal to Indra in glory, next ruled the people. SUBHATAVARMA, whose aim was directed towards confirming the people in the practice of virtue, succeeded to him.

15. The angered prowess of this conqueror, like the fiery rays of the sun, which exercised its thundering rage on the city of *Patan* in (or cities of) *Guzerát*, is witnessed to the present day in the forest-conflagrations that still prevail in the country.

16. On the ascent of this prince to heaven, his son, ARJUNA Rája, succeeded, who still holds on his arms the circle of this earth, as a bracelet encircles the wrists.

17. This prince, when still a child, put JAYA SINHA Rája to flight even in child's play; the eight Dikpáls (or rulers of the eight corners of the world) smiled at his success. Thus his fame reached the ends of the world.

18. He is a very treasure of poetry and melody. SARASWATI', delighted by the accomplishments of this prince, gave him her own lyre and her sacred volumes.

19. To whom but to him, who is equally renowned for the threefold virtues, learning, valour, and generosity, can we attribute the enlightenment of the three worlds?

To this Rája belongs all prosperity. By these presents he informs the officers of Government, all Brahmans and others, the patèl and rayats of the village of Piriwiri in the Shakapur parganá, that in the fort of Mandu, this day 10th Phálgun Shakla of the Samvat year 1267, he has given away this village in free gift, in commemoration of his accession, after the prescribed ablutions and due worship of SAMBHU, and with due regard to the fleeting vanities of this world.

20th verse. As the clouds are drifted along by the wind, so enjoyment from the senses lasts but for an instant: the life of man is like the dew-drop depending from the tip of a blade of grass; and virtue is the only friend that will avail in the world to come.

Thus reflecting upon the vanities of this world, he resolved to seek the (sure though) invisible rewards of a future state. He therefore gave this village to the Brahman GOVINDA, his purohit, the son of JAITRAH SINH, the son of SOMADEVA, the son of DELANA AVASAVIKA, of the Tribe (Prawar) of KÁSHYAPA, VATSÁRA and NAIDHRUVA, of the family (*Gotra*) of KÁSHYAPA, and a follower of the Madhyandina (or Wajasaneya) *shakha* or branch of the *vèdas*. He gave the whole village to its utmost limits, and all its groves of trees, with the full usufruct of its rents and revenues and rights, and of all the moveable property therein, including all right to trove property found therein, that he and his father and mother may increase in good works and in reputation. This gift is to last so long as the moon, and sun, and the earth shall endure, being duly made with consecrated water on a befitting record and with all reverence. Let the patèl and all the inhabitants of this village, bearing the royal generosity in mind, obey his orders, and make over to him the full usufruct of all the rights and dues heretofore paid to Government, excepting only such endowments and grants as have been made to temples and Brahmans. And let my descendants, and all who may succeed me, though not of my blood, well understanding that they will thereby be entitled to a participation in the fruits, preserve and maintain this grant in its integrity.

It has been written,—

"SAGAR and many other princes have enjoyed the earth in succession. But every prince who maintains in full force any grant of a predecessor, acquires the same religious merit and title to future reward as the original donor."

And again it has been said,—

"The Rája, who resumes grants of land made as a religious offering either by himself or by former Rájas, shall become a vile worm to roll in filthy ordure: and shall drag his ancestors down into the same pollution. Reflecting that power and wealth and even life itself, are as unstable as the drop that floats on the leaf of the lotus, let every man refrain from detracting from the good name and from perverting the religious merits of another."

Written on Thursday, 10th Phálgun, Shudha of the Samvat year 1267, by the Ráj-Gúru MADANA, and with the concurrence of the most learned Pandit BILHANA.

II.—*Note on the white satin embroidered Scarfs of the Tibetan Priests. By Major* T. H. A. Lloyd. *With a translation of the motto on the margin of one presented to the Asiatic Society. By* Alex. Csoma Körösi.

Having received lately, with a letter from Bútan, one of the silk scarfs mentioned by Turner as in use in that country and Tibet, which, though rather dirty, is of a superior manufacture and more highly ornamented with figures of deities than those I have heretofore met with, I think it may be presented as a specimen to the Society. I can fully confirm Turner's account of its general use in all intercourse, and am sorry I have not had any opportunity of ascertaining the origin of the custom, which is, I believe, peculiar to Tibet, Bútan, and Sikhim. I applied to Mr. Csoma Körösi for an explanation of the sentences woven in at the ends of the scarf, and that gentleman has kindly transcribed and translated them. I enclose his notes on the subject, and to save you the trouble of a reference, I shall copy what Turner says on this subject; to whose account I can only add that these scarfs are almost indispensable in all religious offerings, as well as on the occasions he mentions.

Titalya, 31*st May*, 1836. T. H. A. Lloyd.

Extract from Turner's Embassy, 4to. Edition, 1800.

Page 67. "We each advanced, presenting, one after the other, a white silk scarf, or long narrow piece of *pelong*, fringed at both ends, as is the custom in these countries, to the Rája, who, keeping his seat all the time, took them in his hand, and passed them to his *zempi*.

Page 71. We delivered to the *zempi*, or master of the ceremonies, a silk scarf for each of us, which being thrown across our shoulders, he dismissed us.

Page 72. An inferior, on approaching a superior, presents the white silk scarf; and, when dismissed, has one thrown over his neck, with the ends hanging down in front. Equals exchange scarfs on meeting, bending towards each other, with an inclination of the body. No intercourse whatever takes place without the intervention of a scarf; it always accompanies every letter, being enclosed in the same packet, however distant the place to which it is dispatched. Two colours are in use for this manufacture, which is of China, white and red: the latter is rather confined to the lower orders: the white is respectful in proportion to its purity and fineness; there are various degrees in both. I am yet ignorant of the origin of this custom, but shall endeavour, at some future time, to obtain an explanation of it.

P. S.—I may also mention that the *kow-tow* or nine prostrations, as knocking the head nine times on the ground, is in these countries always performed by inferiors approaching their superiors."

Translation of a Tibetan sloka, found on a white piece of China scarf, called བཀྲ་ཤིས་རྟ་བཏགས : *b*,krashis kha *b*,tags, or "*scarf of benediction.*"

ཨཱ། ཉིན་མོ་བདེ་ལེགས་ མཚན་བདེ་ལེགས། ཉིན་མཱི་གུང་ཡང་བདེ་
ལེགས་ཤིང་།
ཉིན་མཚན་རྟག་ཏུ་བདེ་ལེགས་པའི། དཀོན་མཆོག་གསུམ་ཕྱི་ཁྲ་ཤིས་ཤོག

The same in Roman Character.

Nyin-mo *b*de-legs *m*ts'han *b*de'-legs, Nyin-mahi gung yang *b*de-legs-shing,

Nyin *m*ts'han *r*tag-tu *b*rda-legs-pahi, *d*kon-chog *g*sum-gyi *b*kra-shis shog.

Translation.

"Blessed the day; blessed the night; the mid-day also being blessed: may day and night, always return (bring) the special favour of the three most precious (holy) ones."

(*Or thus;* the favour of the eminent three holy ones) the བདེ་ལེགས་པ being rendered, in Latin, *insignis, eminens,* &c.

NOTE.—On the cloth the བདེལེགས is not sufficiently distinct; I took it first for བདེ་ལེགས as in the two former lines; but now I correct it as it probably stands on the cloth.

30*th May.* A. CSOMA KÖRÖSI.

III.—*Note on the origin of the Armenian Era, and the reformation of the Haican Kalendar. By* JOHANNES AVDALL, *Esq., M. A. S.*

While the Abyssinians, Babylonians, Egyptians, Persians, Bactrians, and other primitive nations of Asia, have each had their respective epochs, the people of Armenia, where the descendants of the second grand progenitor of mankind began to increase and multiply, are not without a national era of their own. It is not my intention to enter here into a description of the various eras that have from ancient times obtained among the people of the East, as they have been successfully treated of in the chronological works of learned authors. I shall only confine my observations to the origin of the Armenian era, and the reformation of the Haican or Armenian kalendar.

It appears from our historical records that the Armenian era originated in A. M. 3252, immediately after the coronation of the Armenian king Paroyr. Arbaces, prince of the Medes, it must be remembered, having availed himself of the assistance of Paroyr, and of Belesis Nabonassar, a prince of Babylon, succeeded in subverting the Assyrian kingdom, and proclaiming himself king of Assyria. Ensigns of royalty were conferred by the conqueror on both of his powerful allies, each of whom returned from the field of battle to his respective country. This memorable conquest of Assyria was signalised by the commencement of the era of Nabonassar in Babylon, and by the origin of the Haican era in Armenia, which dates 743 years before Christ.

The Armenian era was from the commencement regulated according to solar years, like the eras of the Babylonians, Medes, Persians, and Egyptians. The ancients were of opinion that the solar year consisted of 365 days, without paying any regard to the addition of the six hours, which formed the concluding part of each year. Consequently, the Armenian era, like that of Yezdegird the third of Persia, anticipated the Julian year by one day in every four years. They divided the year into twelve months, giving to each 30 days, and added five days at the end, called Աւելեաց *Aveliaz*, which signifies *added*, and is equivalent to the Greek word pagomen (παγομεν.) Thus the Armenian calendar year was made to comprise 365 days, leaving out the six hours. And according to this mode of computation all the Armenian years are *common*, but not intercalary. The following are the names and days of the Armenian months.

Armenian months.		*Days of the mths.*	*Total of the days.*
Նաւասարդ	Navasard,	30	30
Հոռի	Hori,	30	60
Սահմի	Sahmi,	30	90
Տրէ	Trey,	30	120
Քաղոց	Kaghoz,	30	150
Արաց	Araz,	30	180
Մեհեկան	Mehekan,	30	210
Արեգ	Areg,	30	240
Ահեկան	Ahekan,	30	270
Մարերի	Marery,	30	300
Մարգաց	Margaz,	30	330
Հրոտից	Hirotiz,	30	360
Աւելեաց	Aveliaz,	5	365

Here in the order of the Armenian months are to be seen not only the number of days thereof, commencing from Navasard, which is the first month of the year according to the Armenian era, but also the total of the days of the year up to *Aveliaz* or Pagomen, which invariably consists of 5 days, even in leap years.

According to the above mode of computation, the month of Navasard will commence on the 24th of August in the year 1836, and after a lapse of four years it will begin on the 23rd of August 1840.

In this manner it will anticipate the Julian year by one day in every four years, and after a period of 120 years the difference between the Armenian and Julian epochs will be 30 days. The lapse of 1460 years will increase this difference to a whole year, and the beginning of Navasard will again fall on the 24th of August, the day on which it will have commenced in the year 1836.

It is stated in ancient Armenian chronological works, that the Armenian era was recommenced on the 11th of July, A. D. 552, on which day fell the first of Navasard. But the want of an intercalary day in the Armenian year creates a deviation of the beginning of the month of Navasard from the day of the Roman month, on which it originally commenced. We know on the authority of Armenian authors, that the month of Areg in the early part of the fifth century corresponded with the month of March. NIERSES the Graceful concludes his letter to the Greek Emperor EMMANUEL thus: "Written in the Armenian era 619, in the Armenian month of Areg, and in the Roman month of October." And in an old manuscript copy of the Armenian Ritual is stated thus: "Written in the Armenian era 670, in the month of Mehekan, which corresponds with the month of August."

In the year of Christ 551 the Armenian Kalendar was reformed by the Armenian Pontiff, MOSES the Second, a native of the village of Eliward, in the province of Aragazotn, and eminently distinguished for his extraordinary talents and profound erudition. On his elevation to the pontifical throne, he devoted his attention to the reformation of the Armenian Kalendar. A council was accordingly convened by him in Duin, consisting of learned Bishops and scientific individuals, by whose co-operation he succeeded in remodelling the Armenian Kalendar, as much as the circumstances of the times permitted, by newly commencing the cycle. Thenceforward the Armenian nation adopted the reformed Kalendar, and generally began to reckon their years in accordance with the rule laid down therein. In order to know the Armenian era, deduct from the Christian era 551 years, and the remainder, whatever it may be, will be the Armenian era required. For instance, if 551 years be deducted from 1836, the remainder will be 1285, which is the present Armenian year.

It is usual with the people of Armenia to reckon the hours of the day from sunset to sunset, in imitation of the custom prevalent in ancient times amongst the Italians. The day, consisting of 24 hours, is called in Armenian ԱՒր *Aur*, which entirely corresponds in sound with the English word *hour!* In the Armenian language the hours of the day and night have respectively distinct names, which I shall state below.

Names of the hours of the Day.		*Names of the hours of the Night.*	
1. Այգ:	Aig,	1. Խաւարակ:	Khavarak,
2. Զայգ:	Zaig,	2. Աղջամուղջ:	Aghjamúghj,
3. Զայրացեալ:	Zairazial,	3. Մթացեալ:	Mithazail,
4. Ճառագայթեալ:	Charagaithail,	4. Շաղաւօտ:	Shaghavot,
5. Շառաւիղեալ:	Sharavighail,	5. Կամաւօտ:	Kamavot,
6. Երկրատես:	Erkrates,	6. Բաւական:	Bavakan,
7. Շանթակող:	Shanthakogh,	7. Խօթափեալ:	Khothapail,
8. Հրակաթ:	Hirakath,	8. Գիզակ:	Gizak,
9. Հուր փայլեալ:	Húr Phailail,	9. Լուսաճեմ:	Lusachiem,
10. Թաղաթեալ:	Thaghathail,	10. Արաւօտ:	Aravot,
11. Առաղօտ:	Araghot,	11. Լուսափայլ:	Lusapail,
12. Արփող:	Arphogh.	12. Փայլածու:	Phailazú.

It is recorded in the ancient annals of Armenia, that Armenac, the son of Haic, had twelve brothers, who were respectively called by the names of the twelve Armenian months. He had also twenty-four sisters, who received the respective names of the twenty-four hours of the day.

The Armenians of British India as well as of other parts of the globe, have adopted the use of the old Julian style and months in mercantile transactions, and in their correspondence with Europeans.

IV.—*Conjectures on the march of Alexander. By* M. Court, *ancien éleve de l'école militaire de St. Cyr.*

[Communicated by Captain C. M. Wade*.]

According to Plutarch, the first country through which Alexander passed on leaving Hyrcania, was Parthia. I shall therefore set out from this province, which is supposed to be the modern *Khorasán*; and what confirms us in this supposition is, that to the south of Parthia was situated Tabiana, now *Thabas*, which town is to be found in this direction between two deserts. Another incontestable proof is, that the province of Margiana, which was contiguous to Parthia, is to be found situated in the country of *Meimané*, watered by the modern *Murg-áb*, called Margus by the ancients.

Barbie' du Bocage fixes the capital of the Parthian empire at Nicephorium, or *Nishapúr*. But I must here notice that the town of *Tún* may very probably be Parthonisa, of which he makes mention; and if this be the case, the tombs which are here to be found are those of the kings of Parthia.

* We are indebted to the kindness of a lady friend for the translation of M. Court's valuable Memoir.—Ed.

It was in this province that the traitor BESSUS seized the person of DARIUS, whom he subsequently assassinated. History does not record the spot where the assassination took place. From the statement of PLUTARCH, it appears ALEXANDER sojourned for some time in Parthia. After he left this province his march became exceedingly irregular and confused, and we find no historical elucidation of it. Some historians say that he returned to Hyrcania; PLUTARCH is amongst those who give us this statement; others, however, relate that he marched into Bactriana. RENNEL, the geographer, is of opinion, that on leaving the western provinces of the Caspian Sea he passed through *Aria* and *Zarangæi* to make the conquest of *Arachosia*, and that from thence he proceeded to direct his attack upon the Bactrians. I am led to be of this opinion; and what most strongly induces me to adopt it, is the death of PHILOTAS, which was very much anterior to the murder of CLITUS; and it is well known that the former perished in Zarangæi, and the latter in Sogdiana. ALEXANDER on leaving Parthia passed through Aria, which is watered by the modern Arius, anciently called the *Heriroud*, and which passed by *Herat*. He here built a town, which I imagine must be that called *Obeh*, situated ten farsangs to the east of *Herat*: however, this latter town was built by ALEXANDER, according to the reports of its inhabitants; but some geographers refute their statement by giving as their opinion, that Herat is not the Aria of the ancients. BARBIE' DU BOCAGE says, that *Artacvana*, otherwise called Aria, was the capital of the province of this name. In regard to this, I must notice that in my travels from *Ispahán* to *Yezd*, I found the town of *Ardecon*, in its vicinity, in the same route, the equally ancient town of *Akda*, and quite close to this again was another called *Beni-bít*. Now these three towns bear in their names the strongest resemblance to those called Aria, Artacvana, and Bitaxia, that BARBIE OF BOCAGE fixes in Aria Proper. This country, of which I have just spoken, is situated between *Ardistán* and the province of *Yezd*, and is no other than the Isatœchœ (ισατοιχοι) of the Greeks, where the worship of fire and the institutions of the Magi were established. I must, moreover, notice that at the distance of two days' journey southward of the town of *Tún*, we enter the territory of Bucharia, and here meet with ruins, which may be attributed to the ancient Persians; but I must observe, that neither in this canton or in those of the three above-mentioned towns, is any river bearing the name of Arius to be found.

From Areia, ALEXANDER marched into Zarangæi, now called Sigistan, but a vestige of its ancient name remains in that of the actual capital called *Zarang*, which is no other than the town of *Propthasia*, where ALEXANDER put PHILOTAS to death.

This town was situated at a short distance from the *Etymander*, now called the *Hind-mind*, which river empties itself into the lake *Zéré*, otherwise called *Néibendam*, known by the ancients under the name of the lake Arian. This river receives in its course that which flows from the territory of *Farrah*, and which is no other than the Pharmacotis of the Greeks, for there is not a doubt that *Farrah* was the ancient Phra, the country of the famous RUSTAM of Persia.

From thence he went into Arachosia, a province watered by the river Arachotus, which emptied itself into the lake Areiana, and which is the same as the *Aracandab*, which has its source in the canton of *Navor*, and which subsequently flows through the territory of *Candahar*, and from thence falls into the *Hind-mind* four farsangs below *Gerishk*. The town which was situated on this river, said to be built by SEMIRAMIS, ought to be found amongst the ruins of *Candahar*, or more probably it is the ruins of that town which are visible upon the river *Arcassan*, four farsangs below *Candahár* upon the road to *Shíkárpur*. Two equally ancient towns are those of *Eskarganj*, and of *Sher-safa*, the ruins of which may be seen upon the road which leads to *Ghazní*. As to the Alexandropolis of *Arrokhaje*, it undoubtedly is old *Candahar*. Nicæa appears to me to be *Ghazní*.

The Macedonian conqueror must necessarily have passed through *Candahár*, as the several roads branch off from this town which lead to India, through *Cábúl*, *Ghazní* and *Shíkárpur*; and moreover all the extent of country to the south of Arachosia, is nothing but one desert of moving sands, which occupy a distance of forty farsangs, stretching over as far as the country of *Neskhi* and *Karan*, which form a part of *Balúchistan*.

To the north of Arachosia we find the country of the *Paropamisæi*, separated from Bactriana, by a high chain of mountains, to which the name of *Caucasus* was given by the companions of ALEXANDER, out of compliment to this prince, who wished to traverse them. Here they found a cavern that they transformed into the cave of Prometheus. I have been assured that a similar cavern does exist in the environs of *Candahar*, at the spot called *Khar-Jemshid-jan*. The mountainous part of the country of Parapamisæi is now inhabited by *Hazarés*, amongst whom exist a tribe of the Bactiaris, who doubtless are a descent from the intrepid Bactrians who offered such a valorous resistance to ALEXANDER, and who repulsed him several times before they were made to surrender. I presume that this conqueror penetrated into this country, either by re-ascending the valley watered by the *Aracand-ab*, or by passing through the defiles of the chain of *Gulkau*, near *Ghazní*, where we may remark some dykes built here by

Sultan MAHMUD GHAZNAVÍ. In this passage he had to penetrate through heavy falls of snow before he could reach Bactria, the capital of Bactriana, which they say must have been the same as *Balkh*.

This country, according to BARBIE' DU BOCAGE, extended to the south of the Oxus, a large river which stretched as far as the Paropamisus. It compromises Bactriana, properly so called, and the country of Margiana, of which I have already spoken.

OXYARTES, the father of ROXANA, was king of the whole of this country.

It was at Bactria that ALEXANDER condemned BESSUS to have his nose and ears mutilated. CALISTHENES was arrested at the place called Cariata. PLUTARCH relates, that ALEXANDER was on the banks or confines of the Oxus when he first meditated the conquest of India.

The route which he pursued is, I imagine, the one now adopted by the caravans which pass from *Balkh* to *Cábul*, and which appears to be the only passable road through which this mountainous country can be traversed.

This road passes through the territory of *Bamiana*, a very ancient town, not far from which are to be found the prodigious ruins named *Gulgula*. Six kos further, we meet with others that are attributed to ZOHAK SHAH; and at the place called *Siggan*, there are the remains of a fortress, the building of which the inhabitants attribute to ALEXANDER. If this tradition be well founded, there is not a doubt that it must have been in this spot that ALEXANDER built the town in the country of the Paropamisæi, and from whence he proceeded to Cophenes.

This starting point is a stumbling-stone for geographers, inasmuch as none of them have been able to determine its exact position. For, proceeding in their narration from thence, some state that he marched to *Cow*, which they mistake for Cophenes; and had he done so, he must have quitted the Paropamisæi, gone through the defiles of *Ghazní*, and have precipitated himself from thence to the cantons of *Gerdiz* and *Lougird*; then crossing the country of the *Bangishs* he would have proceeded to Peucelaotis by the route of *Kohát*. In this case *Borikrajan* must be Arigœum, of which we find mention made in history. But I would observe, that along this route no such important river as the Cophenes is to be found; and then again how improbable it appears that ALEXANDER, who had such an immense tract of land to explore, would have ordered his generals HEPHÆSTION and PERDICCAS to conduct a division through a track so distant as that through Peucelaotis. It is then more probable that he must have taken the road to *Cábul*, and from thence dismissed his generals, with orders to proceed in their route to *Jelálábad*,

and he himself pursued that which led to *Lagman*, and which answers the historical description, being very rugged and mountainous, but still such as to allow the cavalry to penetrate through it. From thence he could give assistance to that division of his army which were detached towards Peucelaotis.

Whilst pursuing this train of supposition, I cannot help observing that the Macedonian conqueror must of necessity have passed through *Cábul;* for its geographical position is so brilliant, so advantageous, that it is a military position which we cannot but suppose that he noticed, and therefore traversed it.

It is then only the more unaccountable, that to this day that no geographer has been able to ascertain the ancient name of this town, the foundation of which the inhabitants attribute to Keikobad. From the fertility and luxuriance of this territory, I am led to think that it must be the same as Cabura or Ortospanum, of which Barbie' du Bocage speaks, describing it as "a town situated upon the route which led from the Alexandria of the Areians to India, and which was not very far from the Paropamisan Alexandria."

Rennel's opinion appears to be erroneous when he says, that the *Cow-mul* of Baber Shah is the same as the Cophenes, the principal branches of which, he adds, are rivers flowing from the *Ghazni* and *Guerdïz;* for the river *Ghazni*, according to the account given by its neighbouring inhabitants, empties itself into a lake which is situated at the south of *Moukkor*, in the canton of *Zermele*. As to the branch called the *Guerdiz*, it is no other than a narrow stream, and can scarcely be denominated a river. On the other hand, he adds, that the river of Cophenes was defined as the eastern boundary of the province of Paropamisus, of which Alexandria was the capital. I must observe, that from the direction the *Cow* takes in its course, it goes too far southward of the Paropamisus to form its eastern boundary; what he says there seems to have a more just reference to the province of Arachosia.

I am very tenacious, then, of my opinion, that the Cophenes must be the same as the river of *Cábul*. This river has its source in the country of the *Hazarés*, betwixt *Bamian* and *Cábul;* it has its fall in the mountains of *Meidan*, through which runs the road which leads from *Cábul* to *Balkh;* from thence it traverses *Cábul*, and receives below this town the river of *Shéikabad*, which also takes its source from the *Hazarés;* a little lower still it is enlarged by its junction with the *Panje-shir;* this takes place at the spot called *Teng-carun*. From thence it proceeds in its course through a mountainous part of the country, and empties itself in the western extremity of the valley

of *Lagman*, where it receives the waters of the *Alumkhar*, which flow downwards from that territory. We follow it from thence into the valley of *Jelálábad*, where it is enlarged by its junction with the *Surkh-áb*, which rises in *Peivar;* and then again it receives the *Khonár*, which flows through *Kaféristán*. In leaving this deep valley it passes anew through the mountains of *Dekha*, and empties itself at *Micheni* in the province of *Pesháwar;* and when passing a short distance from *Ashnagar*, it receives below that town the *Jind*, which flows from the country of *Baajor*, then passes by *Nouchareh*, *Akhora* and *Jengír*, and from thence finally empties itself into the Indus; and here we lose it about half a league below the fortress of *Attok**. From *Cábul* to *Jelálábad* it is known by the name of the river *Cábul*, in the *Moumends* by that of *Khameh*, at *Pisháwar* they give it the name of *Nagouman*, and below that it is called *Landeh*, by the *Kattuks* and Yusufzies.

From its source to *Ashnagar* it abounds in rapids, which make it quite unnavigable in the rainy season, and more particularly so during the heavy falls of snow, which swell it out to a prodigious breadth. I have above concluded that ALEXANDER took the route to *Lagman*, after having ordered his generals to go to Pencelaotis.

The Aspii and the Thyræi that he attacked, appear to me to be the *Buzbins* and the *Touris*, who inhabit the mountainous part of the country which separates the valleys of *Lagman* and of *Jelálábad* from the territory of *Cábul*. As to the town of Arigæum, which was found beyond these mountains, it may be *Alichung*, a very ancient town situated in the valley of *Lagman*. That of Tigueri, which is here to be observed near the rivers of *Meitarlam*, is also of a very ancient date. The two rivers of Choe and of Evaspla, that he must have crossed in order to arrive, must in all probability be the *Penj-shir* and *Alumkhar*.

The valley of *Lagman*, as also that of *Jelálábad*, were formerly inhabited by an idolatrous people, who were driven after the first conquests of the Mahomedans beyond the chain of *Hindu-kou*, the Emodus of the ancients. They are now known under the names *Siáposh* or *Kaferis*, and the country that they inhabit is just below that of *Kaféristán*.

* The latter part of its course may be traced on a map, which we have been permitted to copy from M. COURT'S original survey on its way to the Asiatic Society of Paris, and which, with a few extracts from his geographical notes on the country, will appear in our next number.—ED.

These nations declare that they are descendants of the *Ghorís*, which name resembles greatly that of *Guræi*, of which notice is taken in history.

At *Jelálábád* ruins of a considerable extent are to be found: their origin is not, however, known. It is the same with those that may be observed three stages further off, near the defile of the *Kheibers*, and which are called *Pishboulak*. These last are situated on the northern range of the chain of *Sefidkoh*, and not far from thence is the village of *Azarno*, which one meets in the road from *Jelálábád* to *Pesháwar*. In these ruins are to be found some medals exactly like those of *Manikyála*; and from this I am led to believe that these towns must be of equal antiquity. It remains now to discover what were the names by which they were then called. The *Muminds* appear now to occupy the country of the Assaceni, against whom Alexander marched, after having crossed the Guræus. This river, which he crossed with great difficulty, appears to me to be the *Khonar*, a river the stream of which is very rapid and full of polished stones, like the *Alumkhar*: it flows from *Kaféristan*. If it be not this river, it must be that of *Cábul* itself, which here took the name of Guræus, from the Ghoræus which inhabited the banks, or rather the Jinde which traverses the country of *Bajru*.

From thence Alexander went into the country of Bajru, called by us Bijore. This town is situated 60 kos N. N. W. of *Pesháwar*: is very ancient, and we may there find many medals like those of *Manikyala*. It remains to be proved if it is really there that we find the Bazira of the Greeks. This mountainous country is traversed by the river *Jinde*, which divides it from the canton of *Suwát*, and which after having emptied itself into the defiles of the *Tengui* passes to the west of *Ashnagar*, throwing itself from thence into that of *Cábul*. If *Bajor* be the Bazira of the Greeks, it is in this country that we must search for the famous mountain of Aornus, the seizure of which was one of Alexander's most brilliant exploits.

From this country Alexander passed towards the Indus, and took possession of the town and fortress of Peucelaotis, which Hephæstion and Perdiccas had been besieging for upwards of a month.

Several geographers think that this province is the same as that of *Pesháwar*. In this case the Malamantus, upon which Peucela was built, is no other than the river *Barreh*, which flows downwards from the *Kheiber* mountains, and which loses itself in that of *Cábul*. Rennel, led into error by Forster, supposes that *Pakkheri*, which he calls *Pukkholi*, was the Peucelaotis of the Greeks. This last town was found at the west of the Indus, whilst *Pakkherí* was at the east of

this stream, and at a considerable distance from it, and moreover in a mountainous country, where the Indus has never been able to change its course. Besides, Peucelaotis was contiguous to Bazira, a town that they suppose must have been *Bajúr*.

From Peucelaotis Alexander returned on his steps, directing his march towards the north-west, in order to investigate Aornus. After the capture of this rock, he made a second expedition into the country of the Assaceni, between Bazira and Peucelaotis.

Ashnagar, which several geographers mistake for Massaga, the capital of the Assaceni, appears to me to be the town of Nysa. Its vicinity to Cophenes, and above all what PLUTARCH states that ALEXANDER said to the Macedonians, who hesitated and seemed to fear encountering so deep a river, all corroborate my conjecture. I must, besides, observe, that three *kos* below this town, and on the borders of the *Cábul*, is the village of *Nysetta*, where there are some vestiges to be found. All the suburbs of *Ashnagar* are scattered over with vast ruins, of none of which we know the origin, and where we find some very ancient medals. The actual fortress of *Ashnagar* overlooks this territory.

In starting from thence to the Indus we meet no other river, with the exception of a small stream which flows from the *Babúzies*, and which passes between the *Hottí* and the *Kapourdigarhi* to throw itself from thence into the river *Cábul*, below the *Nouchareh*.

At six kos to the N. E. of *Ashnagar* is the mountain of *Behhi*, isolated upon a vast plain, and upon which may be remarked the ruins of a very vast town, which seems to be of most ancient date, and which, according to the reports of its present inhabitants, was the residence of the ancient kings of that country. Specimens of bas reliefs may there be found; also the remains of an aqueduct, by which thence the waters of *Ashnagar* were carried to the town. At eight *kos* to the north of *Behhi* we see the summit of a mountain, situated between the canton of the Babúzies and the massive ruins of a fortress, which was only accessible by a path cut through the rock.

This spot is called *Pelley*. At 18 *kos* N. E. of *Ashnagar* we see on the southern range of the mountain called *Kohganga* the vast ruins of a town, that the present inhabitants say was peopled by idolaters, and which is quite close to the existing town *Bazar*. At 15 *kos* to the east of *Ashnagar* is the actual town of *Kapourdigarhi*, which from its locality might well be the ancient Caspatyrus, the capital of the Gandarii, which is placed by our geographers to the east of Assaceni, on the western bank of the river Indus.

I have remarked, that close to this town is an inscription in characters quite similar to those we observe on the ancient Indian medals

of *Manikyala**. To the west of this town is the territory of *Hotti* or *Hoddi*, which received its name from an ancient sovereign of this country, who might have been the Omphis who surrendered himself to Alexander.

On the western bank of the Indus ruins may be observed at *Pevur Toppi*, *Hound*, and *Mahamadpur*. Those of *Hound* are all striking, and there may be found blocks of marble containing inscriptions traced in characters quite unknown to the inhabitants.

As for the ruins of *Mahamadpur*, situated at the junction of the Indus and the river *Cábul*, they are, we are told, more than two thousand years of age. After having exhausted the above facts relative to the country of the *Youzoufzies*, I shall be led to form more than one conjecture on the true position of Bazira; but I have been quite perplexed by Rennel, who says that "Alexander after his arrival at the bridge made an inland excursion into the country situated on the western banks of the Indus, to visit the town of Nysa, and that he subsequently penetrated into the country situated between the two rivers of Cophenes and Indus."

Being quite devoid of all references or means of solving my doubts, I am obliged to adopt the supposition of this judicious guide.

As to the Assaceni who inhabit the lower part of the western bank of the Indus, they are only inhabitants of *Katteuk*, and the town of *Ora* is perhaps the same as Akhora. As to that of Sabissa or Capissa, we must seek for it in the canton of *Lachittiri*, or in that of *Kohát*.

As relates to Aornus, which is situated in this country, and of which Alexander made himself master, it is probably the castle which was opposite *Attok*, and the vestiges of which we see upon the summit of the mountain: its foundation is attributed to *Raja-Hoddi*. According to some geographers, Attok is the town of Taxila; through which the army of Alexander effected the passage of the Indus. If it be not this town, we must recognize it in that of Torbila: the locality of the ruins which we there remark lead me to form this conjecture. It is possible besides, that this name may have undergone some change in its orthography. We know that the Greeks were not exact in their mode of spelling the names of the towns and countries which they invaded.

* We have written to M. Court to request, if it be possible, that facsimiles may be procured, both of the inscription near *Ashnagar*, and of those on the marble blocks at *Hound*. The Pehlevi inscription copied by M. Court from one of the Manikyala topes has excited very great interest at Paris: it would be very desirable to obtain a precise facsimile of it.—Ed.

V.—*Experimental Researches on the Depressions of the Wet-bulb Hygrometer.* By JAMES PRINSEP, *F. R. S. Sec. As. Soc.*

At the first meeting of the British Association for the advancement of Science, the Committee appointed to draw up a list of desiderata in the various departments of science, included among the objects of meteorological inquiry an investigation of the theory of the wet-bulb hygrometer: and in the circular then prepared, and at the subsequent annual meetings repeated, the Meteorological Committee was pleased to compliment with its favourable notice the papers published anonymously on this subject in the Calcutta "*Gleanings in Science.*"

The requisition of the British Association appears to have remained unanswered until the Dublin meeting in August last, when Professor APJOHN, of the Royal College of Surgeons in Dublin, brought forward the results of his own experiments, and expounded a simple and elegant formula which he had in every case found to agree with them, and to be practically applicable to the various conditions of the problem.

Dr. APJOHN's papers are published in the Philosophical Magazine for March, October and December, 1835; and it is principally an observation in the opening of his memoir which induces me to revert to the subject. "In the first report," he says, "mention is made of a register of observations kept in the East Indies, which, as belonging to high temperatures, would necessarily exhibit great depressions, and would therefore be valuable as a standard of comparison; but I have in vain searched for the Calcutta Journal '*Gleanings in Science*,' in which they are said to be contained."

In one respect we may deem it fortunate that the sluggish circulation of our humble periodical had not attained the shores of Ireland; if to the want of the data which "the Gleanings" might have furnished we are indebted for the series of experiments undertaken by Dr. APJOHN; for the more varied these may be, and the more numerous the observers, the more confidence may reasonably be placed in any formula that may accommodate itself to the whole.

I might without vanity claim to my own share as large a portion of the labour of experimental investigation as has rewarded the patience of any observer of the wet-bulb indications; having, with little intermission, registered daily observations since 1822; but I am more anxious to claim for my lamented fellow labourer, Captain HERBERT, the merit of having treated the theoretical portion of the subject—I will not say in a more philosophical manner than had hitherto been followed, because GAY LUSSAC had before exercised his masterly hand upon it, but,—in a manner equally sound in principle and creditable to himself,

considering that he had not the means of referring to the original memoir of the French philosopher, and that he had only the erroneous views of the *Edinburgh Encyclopedia* to guide, or rather to misguide, him.

In Captain Herbert's first paper*, he reviewed with unsparing criticism the paralogistic reasonings of the Encyclopedist, Mr. Anderson, and pointed out the true basis of the wet-bulb depression so nearly in accordance with the views of Dr. Apjohn, of Dr. Hudson his coadjutor, and of M. Gay Lussac, that it establishes the general correctness of all, although the particular formula which he proceeded to build upon it, naturally agreed best with the data that my own experiments, published also in the Gleanings of March 1829, had furnished to him. He had fortified himself for the investigation by previous study of the doctrine of the latent heat of gaseous bodies, upon which subject he had published a brief but luminous essay in the Oriental Magazine for September 1827; and certainly no subject has so much needed a sprinkling of rationality to lay the dust of unphilosophical hypothesis which even yet remains to obscure a plain question; so much so, that Dr. Hudson, one of our Dublin competitors, while he acknowledges the dependence of the problem on the relative capacity for heat of air and aqueous vapour, "will not dwell on this method nor the corrections it would require, placing no reliance on the truth of the requisite assumptions†."

But before entering into a review of the various theories that have been adopted by others, it may be preferable to describe in as succinct a manner as is consistent with clearness, the course I originally pursued to supply the experimental requisites for calculation, and upon which I ventured to form a table‡ for the reduction of wet-bulb indications to hygrometric degrees in 1828-9§. I have recently concluded a second and even more extended series of similar experiments, with the advantage of superior means and apparatus, which have enabled me to prosecute some branches of the inquiry that I believe have not before engaged sufficient attention.

In all hygrometric speculations it is usual to consider the state of extreme moisture, or the point of aqueous saturation of the air, as

* Gleanings, Vol. I. p. 45.

† Phil. Mag. Vol. VII. p. 259.

‡ Gleanings, Vol. I. p. 81.

§ Before this period in 1827, I furnished a "table of multipliers" for reducing the depressions into aqueous tensions, calculated from three years meteorological observations at Benares with this instrument and the hair hygrometer. The Royal Society, who did me the unexpected honor to publish my registers, retrenched this table, and the notes which accompanied it. They had been, however, in the mean time printed in the Calcutta *Oriental Magazine* for March, 1827.

represented by 100°; while extreme dryness, or entire absence of aqueous vapour, is expressed by 0°. The intervening degrees comprehend every intermediate state of moisture that can possibly occur, and conveniently express the percentage of actual moisture present, or as it is more scientifically termed, the *centesimal* tension of the vapour.

The point of saturation on the wet-bulb instrument (100) is indicated by 0°, because evaporation, and the cold consequent on it, then ceases. The questions to be solved then are, 1st, What is the maximum depression, which corresponds to perfect dryness (0) in the assumed scale, for every temperature?—and 2nd, What is the value of each intermediate degree (Fahrenheit) of depression of the wetted thermometer in terms of the *centesimal tension* or 100 hygrometric degrees above alluded to?

I. There is one very easy method of attaining the first object: viz., by exposing a wet-bulb thermometer to a current of perfectly dry air of various temperatures. This was the mode pursued by GAY LUSSAC between the temperatures 32° and 70°, in 1827: by myself in 1829, between 70° and 140°, and recently continued up to 700° Fahrenheit: it is the plan proposed to be pursued by Dr. HUDSON*, and employed in the test experiments of Professor APJOHN in 1835†. In fact, this is the only accurate plan of testing the maximum depression, which is to represent 0° on the hygrometric scale: for the exposure of a wet-bulb thermometer in *still air* dried to the utmost, fails to produce a maximum, the instrument being necessarily surrounded with a medium not perfectly dry. Dr. APJOHN makes the error by this method $\frac{1}{6}$th; I have found it about $\frac{1}{10}$th.

II. The second question, as to the value of intermediate depressions? may be ascertained by drying the air to various points, as 20, 30, 40 per cent. which can be done by exposing it to various saline liquids, or more conveniently to sulphuric acid of different strength, and then submitting the thermometer to a current of it as before. This mode was used long since by M. GAY LUSSAC in testing the value of the degrees of SAUSSURE's hair hygrometer, and it was followed by myself in a repetition of the same train of experiments in 1825‡. To obtain, however, an equable current of wholly or of partially dried air for a sufficient duration of time, is by no means easy; nor do I think that air merely passed through a tube containing sulphuric acid or chloride of lime, without remaining in protracted contact with it, would be thoroughly deprived of moisture. At any rate, to ensure confidence, there should be the means at hand of record-

* Phil. Mag. Vol. VII. p. 260.

† Ditto, p. 271.

‡ See BRANDE's Journal of the Royal Institution, XXII. 28.

ing its actual state. M. Gay Lussac merely dried his air by chloride of lime, and his depressions will be seen to be all below the mark.

Professor Apjohn states, that he pressed air from a caoutchouc bag through three of Wolfe's bottles, passing it thrice through the acid on its way to the thermometers. This must have been inconvenient and difficult to regulate, and the knowledge of the real condition of the air was withheld; although there can be little doubt that it was thoroughly dried. My own method was to dry the air previously for days or even weeks in a large gasometer, whence it could be driven in a very uniform current. The secret of the facility I enjoyed in this respect lay in the substitution of *cocoanut oil* for *water* in the reservoirs of my gasometers, which not only prevented the accession of moisture, but preserved the gas unaltered for any length of time;—I have fearlessly lighted a jet of hydrogen that had stood *two years* in my gasometer!

There are other modes of obtaining intermediate stages of dryness: the most obvious is by using the atmosphere itself of a dry or damp day, first ascertaining by Dalton's dewpoint experiment its actual hygrometric state, and noting the corresponding indication of the wet bulb thermometer; the averages of a good meteorological register are of this kind. Again, when damp air is artificially heated by passage through a warm tube, the capacity of the warm air for water being increased while the dew point remains unchanged, an effect tantamount to using drier air may be obtained and exactly estimated. The rarefaction of air also, (in the absence of the means of fresh supply of water) produces a measurable diminution of the ratio of humidity per given volume. These simple methods have been used by all experimenters, particularly by Leslie himself, the original projector of the evaporation-hygrometer.

In describing, therefore, my experiments directed to the two main inquiries, it will save some circumlocution to designate the methods pursued as, 1st, dry air current; 2nd, current of air having given aqueous tension; 3rd, heated air of known tension; 4th, rarified air do; and 5th, dew-point comparisons.

But there are other important branches of inquiry necessary besides the above two, ere we can hope for a formula to satisfy all conditions of the wet-bulb problem.

III. The experimental effect of diminished and augmented atmospheric pressure?

IV. The amount of depression in other gaseous media? and

V. The effect of greater or less velocity of the air on the temperature of evaporation? This effect has been sufficiently examined by

DALTON himself, as regards the *quantity* of water evaporated. Theoretically, however, it has no influence on its temperature; and this is confirmed by experiment, under certain limitations.

With such an appalling complication of influences to be traced out, it is hardly to be wondered at that M. GAY LUSSAC himself should have given up the prosecution of the wet-bulb problem, or that the Editor of the Royal Institution Journal* should have joined in its condemnation at a time when the elegant method of DANIELL was winning general favor. Nevertheless, independently of its direct preferability as the most simple mode of registering the humidity of the air, the problem itself is of the highest importance, in the solution not only of very many phenomena in pneumatics and meteorology, but of such standard doctrinal points of theory, as the latent heat of gases and steam; and others of practical utility—as the artificial production of ice and cold. I shall have occasion to adduce a few illustrations ere I conclude; but I must now proceed to my first series of experiments.

§ 1. *On the curve of maximum depression.*

The apparatus used for drying the air is sectionally depicted in Plate XXI. fig. 1, where *a* is a dish containing concentrated sulphuric acid enclosed in a 120 pint gasometer. Another similar dish rests in the glass double bell receiver *b*, wherein are suspended a hair hygrometer (the only instrument applicable as a tell-tale, and indeed an invaluable hygrometer for every purpose) and a delicate thermometer. Through this receiver the air of the gasometer passes to the stopcock and short glass tube *c*, in which is placed a small thermometer, covered with muslin and dipped in distilled water at the moment before the experiment commences.

The only difference in the order of M. GAY LUSSAC's experiments, being, as I have stated above, that he employed chloride of lime *without a tell-tale hygrometer*, while in my first Benares series I employed the same salt *with this addition*, it would be easy to apply to that philosopher's results the correction I found necessary for the want of complete desiccation in my case. At all events, as his series comprehends low temperatures, which were beyond my reach in India, it will render my review of the question more complete to insert his valuable table, converting the centigrade expressions into those of Farenheit's thermometer. In the fourth column I have added the aqueous tensions† at the wet-bulb temperature; and in the fifth, the quotients of

* Jour. Roy. Inst. XV. 296.

† By BIOT's formula founded on DALTON's experiments, and published in the Edinburgh Encyclopedia, Mr. ANDERSON's article *Hygrometry*.

the depressions divided by these tensions, which will be found to be the key to the formation of a *formula* for the problem.

TAB. I.—*Depressions observed by M. Gay Lussac.*

Temp. of dry air t	Wet-bulb therm. t'	Depression wet-bulb D	Aq. tens. at t'. f'	Qut. of D ÷ f'	Temp. of dry air. t	Wet bulb therm. t'	Depression wet bulb. D	Aq. tens. at t'. f'	Qut. of D ÷ f
°	°	°	in		°	°	°	in	
32.0	22.0	10.0	.139	72	57.2	38.7	18.5	.252	73
33.8	22.8	11.0	.143	76	59.0	39.5	19.5	.260	75
35.6	24.1	11.5	.153	75	60.8	40.6	20.2	.268	75
37.4	25.4	12.0	.157	76	62.6	41.7	20.9	.280	75
39.2	26.9	13.3	.166	74	64.4	42.9	21.5	.292	73
41.0	27.9	13.1	.172	76	66.2	44.0	22.2	.304	74
42.8	29.1	13.7	.179	76	68.0	45.1	22.9	.316	72
44.6	30.2	14.4	.186	72	69.8	45.2	23.6	.317	74
46.4	31.5	14.9	.195	77	71.6	47.3	24.3	.340	71
48.2	32.7	15.5	.204	76	73.4	48.4	25.0	.354	70
50.0	33.9	16.1	.213	75	75.2	49.5	25.7	.363	71
51.8	34.9	16.9	.220	77	77.0	50.5	26.5	.380	70
53.6	36.1	17.5	.231	76					

Average ratio of depression to aq. t., 74

It will be remarked, that with exception of the three or four last experiments, the depression follows a nearly uniform ratio to the aqueous tension, being 74 times greater. The air in the last four was doubtless not quite so dry as in the others; for in my own first series, which begins nearly where the French table leaves off, the depressions are found considerably in excess of M. GAY LUSSAC's results.

In the series in question the presence of the hair hygrometer enables me to make an approximate correction for imperfect dryness founded on a coincidence, which will be explained hereafter, between the curve of depressions and the curve of the hygrometer, so that nine degrees of the latter + or —, for instance, will nearly represent 9 per cent. + or— in the depression, near the dry extremity of the scale*. The barometric correction will be also explained further on.

TAB. II.—*Maximum Depressions determined at Benares.*

Temp. of dry air t	Wet-bulb Therm. t'	Observed depression. d	Barom. at 32° B	Hair Hygrom. H	Corrected depression. D	Corrected wet bulb t'	Aqueous tens. at t' f'	Quotient of D ÷ f'
°	°	°			°	°	in	
72.5	47.2	25.3	29.43	9.5	27.5	45.0	.315	87
75.0	48.2	26.8	.52	9.5	29.3	45.7	.321	91
78.5	52.1	26.4	.30	9.5	29.3	49.7	.369	78
82.6	54.8	27.8	.26	9.5	30.3	52.3	.403	75
83.5	54.5	29.0	.25	8.	31.3	52.2	.402	77
84.7	55.0	29.7	.30	9.5	32.3	52.4	.405	80
85.0	55.0	30.0	.30	8	32.2	52.8	.411	80
85.0	54.8	30.2	.20	8	32.5	52.5	.407	80
90.2	56.8	33.4	.15	9	36.1	54.1	.429	82
90.3	56.7	33.6	.15	8	35.9	54.4	.434	83

In continuation of the foregoing, I will now give the Calcutta series, in which sulphuric acid was used in lieu of chloride of lime,

* This mode of correction was not adopted in my former paper, and the depressions were consequently too low.

and a greater dryness consequently attained; though in some cases I had not the patience to wait until the hygrometer marked 0: in fact, if it did, there was usually enough of moisture in the passages of the gasometer to cause a fall of 1 or $1\frac{1}{2}$ degrees in the tell-tale hair hygrometer, ere the air reached the vent.

TAB. II. *2nd pt.—Maximum Depressions determined at Calcutta.*

Temp. of dry air t	Wet-bulb Therm. t'	Observed depression d	Barom. at 32° B	Hair Hygrom. H	Corrected depression. D	Corrected wet-bulb t'	Aqueous tens. at t' f'	Quotient of $D \div f'$
o	o	o			o	o	in	
94.8	57.8	37.0	29.67	5	38.7	56.1	.459	84
94.6	57.3	37.3	.51	1?	37.7	56.9	.471	80
96.4	58.4	38.0	.43	2	40.0	56.4	.462	82
92.0	56.1	35.9	.50	3	37.0	55.0	.442	84
88.7	54.4	34.3	.55	3	35.2	52.5	.406	86
87.0	54.8	32.2	.44	4?	33.4	53.6	.420	79
83.1	52.1	32.0	.50	2	32.5	50.6	.381	85
88.2	54.5	33.7	.46	3	34.6	53.6	.420	82
82.6	51.7	30.9	.50	2	31.4	50.2	.376	84
80.9	51.1	29.8	.55	1	30.1	50.8	.384	78

The same uniformity in the quotients of the last column will be remarked in these two tables, but the average is now 81.8, considerably higher than the Paris result.

Having thus by the ordinary atmospheric temperature of a Calcutta laboratory in May, brought up my train of observations to 96°; and finding that the depressions so much exceeded those for the same portion of the series ascertained at Benares by suspending a wet-bulb thermometer in a vessel of sulphuric acid heated successively from 90° to 140°*, I devised the following method of extending the dry-air current series to temperatures still more elevated.

In the first place, the gas-pipe of the gasometer was encased for about four feet of its length in a larger leaden pipe connected with my small steam engine, so that a current of steam could be maintained in the latter during the continuance of the experiments, as is shewn in fig. 2. Pl. XXI. The extremity of the gas-pipe terminated in a glass tube holding, first, a dry thermometer, and an inch further on, the wet-bulb thermometer, inserted through corks.

On letting on the steam, (the two thermometers being stationary at 92°,) one began to rise rapidly, while the other fell very slowly. I could not, however, succeed in getting the former to rise beyond 190°, though the steam itself was at 215°. The wet-bulb then stood at 85°.0 and it fell to 80°.4 at 180°:—80 at 170, and 79.5 at 166. The

* See Gleanings, I. 79. I purposely exclude these results in the present place, lest they should confuse the view; but they are, nevertheless, valuable in another sense, as shewing the difference, between the depression in calm air and in a current.

fluctuations of the dry thermometer being so considerable for a nearly stationary temperature of evaporation, it was somewhat difficult to determine the exact terms of coincidence; but the above are selected as the best from a great many readings recorded in my note book.

In a second experiment with air containing $\frac{6{\cdot}0}{100}$ ths of aq. ten. at 94°.3 ($= \frac{7}{100}$ ths at 170°) the dry thermometer became stationary at 170°, with the wet at 87°.7.

In a third trial, aq. ten .65 at 94.6 ($= \frac{6{\cdot}5}{100}$ at 180) the stationary points were 180, and 90.

In a fourth, dew-pt. 74.3 (aq. ten. = 4.4 at 190) the same points were 190 and 92.2—Bar. 29.50.

Barometer	Thermom. in curt. of air. °	Wet-bulb Thermom. °	Observed depression. °	Cen. aq. tens.	Corr. for do.	Aqueous tens. at t'	Quotient D $\div f'$
29.55	190	85	105.0	0?	0?	1.17	89
	180	80.4?	99.6	0	0	1.01	98?
	170	80.	90.	0	0	1.00	90
29.50	190	92.2	97.8	.044	+7.2?	1.17	89
	180	90.	90.	.065	+7.4?	1.12	87
	170	87.7	82.3	.07	+7.7?	1.00	70

Observing the very rapid increase of the evaporating depression with the rise of the temperature, I perceived that I might safely carry my experiment to much higher limits than the boiling point of water. I accordingly next passed the current of dry air through a porcelain tube maintained at a bright orange heat in a Black's furnace (fig. 3, Pl. XXI.) At the further end of the tube a lateral hole was perforated to admit the bulb of the thermometer, coated with two-fold muslin that it might hold a larger supply of moisture. It was necessary to watch the experiment carefully, as, the moment the water was removed, a sudden rise took place, which would have otherwise broken the thermometer, while the cloth and cork were instantly charred with the heat. The actual temperature of the dry current was then estimated in the following manner: a thermometer, with the tip of its stem left open, was held mid-tube in the position previously occupied by the wet-bulb. In a few minutes the mercury boiled off, shewing that the temperature somewhat exceeded 656°. A very thin slip of tin was instantly fused: one of lead was then held within the tube, but it required to be passed a little in advance of the position of the wet-bulb ere it melted:—we may therefore assume the heat of the dry air to have been under 700°. Two experiments agreed precisely in giving the temperature of evaporation 145°. With a very rapid current the wet-bulb thermometer fell to 144°, but probably the air had not then time to get thoroughly heated in traversing the furnace.

There would have been little satisfaction in carrying this train of research further, because of the difficulty of measuring the temperature; otherwise it is evident that the coated thermometer might be safely trusted in a much greater heat, ere it would itself reach even the boiling point of water under the ordinary pressure; an illustration of which will be hereafter mentioned, but, not being strictly experimental, it cannot be introduced here.

Having however accumulated abundant data for the formation of an experimental curve, I may proceed to throw them together in the form of a diagram (fig. 4.), and to compare at once the results with the various formulæ that have been proposed by different philosophers.

As, however, each author has employed different algebraic characters for working out the problem, it will be better first to bring them to common terms, adopting the most simple expressions: thus let

t = the temperature of the air.

t' = the temperature of a wet-bulb, or of an evaporating surface.

t'' = the temperature of saturation, or the dew-point.

then f, f', and f'' may be conveniently used to represent the *force of aqueous vapour*, at t, t', and t'' respectively. d, the depression, is of course $= t - t'$, and not absolutely wanted, but it is frequently a more convenient expression; and D may be also used to distinguish the *maximum depression* in dry air, when $f'' = 0$.

Now supposing the increasing temperatures, t, to be represented by the abscissæ of the divided line TT, the observed depressions may be laid off as ordinates, through the apices of which a dotted line being drawn, will form an *experimental curve of maximum depression*, for which a mathematical expression is required.

Next, to collect the materials for the theoretical curves to be entered in the same diagram, we must take a cursory view of the existing theories.

LESLIE, who must be regarded as the inventor of the wet-bulb hygrometer, deserves the precedence in this inquiry. His experiments were conducted by approaching a dry and a wet thermometer together gradually towards a heated furnace in a closed chamber. The Professor calculated the hygrometric conditions of the air as its heat rose; and on comparing his results, he was led to the conclusion, that as the caloric necessary to convert water into steam was = 6000 degrees of his instrument, and the capacity of air was $\frac{3}{8}$ths that of water, the same measure of heat would raise an equal mass of air, 16000 degrees; and consequently that at the temperature of the wet-bulb, t', air would take up the 16000th part of its weight for each

degree marked by his hygrometer, which is equal to the 2880th part for each degree of depression by the common thermometer.

Now p (Barometric height) may be substituted for the weight of the air, and f' for the saturation weight of vapour at t' : therefore by the above data f' will be $= \frac{d \times 2880}{30} = \frac{d}{96}$ or, (as d is the object sought) d (or D) $= 96 f'$, at the pressure 30.

This simple enunciation, making D in the direct ratio of f', is unduly criticized by M. Anderson in his elaborate treatise on hygrometry in Brewster's Encyclopedia ; but while in reality it will be found closely to agree with the experimental data, and with the subsequent formulæ of others, the new expression deduced from "the laborious investigations" of the critic, turns out to be wholly at variance with experiment, except accidentally at the temperature of the single trial he has himself recorded : his formula (omitting the correction for the barometer) is $D = \left(36 - \frac{D}{10}\right) (f - f'')$ which, when $f'' = 0$, is convertible into

$$D = f \times 36 - \frac{D}{10}$$

making the depression depend on the tension at t, instead of at t'.

M. Gay Lussac's memoir should, I fancy, precede Mr. Anderson's. It was written in 1815, though not published until 1822. The rationale of his formula is explained in these words :—

"Le froid produit (par l'evaporation) est à son *maximum* lorsque le calorique absorbé par la vapeur est égal à celui que perd l'air pour se mettre en équilibre de temperature et de pression avec elle, plus à celui versé sur la surface évaporante par les corps environnans ; mais la quantité de ce dernier, lorsque le froid produit n'est que de quelques degrés, est très petite en comparaison de l'autre, et peut etre negligée." If, therefore, on one side the latent heat of vapour (l) and its density (δ) be combined with its weight (f') ; these should counterbalance the weight of air $(p - f')$ combined with its capacity (c) and the number of degrees cooled (D or $t - t'$) ; that is, $f' \delta l = (p - f') (t - t') c$

or, at 30 inches, $f' \times .625 \times 960 = 30 - f' \times d \times .2669$ and

$$D = \frac{2247 f'}{30 - f'} ,$$

depending as before on f'. With *dry* air, the divisor in this equation should, I imagine, lose $- f'$ altogether, which would elicit the value of d, $= 74.9 f'$; a value lower than Leslie's, but almost exactly agreeing with M. Gay Lussac's own experiments detailed in Table I.

Captain Herbert's formula was founded on the proposition that "when the equilibrium or stationary point of the wet-bulb is attained,

the indefinitely small decrements of caloric from evaporation are balanced by the indefinitely small increments arising from conduction and radiation in the equally small moments of time." Now as Messrs. DULONG and PETIT have shewn that the rate at which a body cooled below the temperature of the air (by conduction and radiation) reacquires heat, is proportional not to the simple difference of temperature, but to that difference raised to the 1.233 power; hence it should follow that the amount of evaporation should increase in the same ratio; "but," says he (page 191), "how determine the rate of evaporation? One of the most striking phenomena of evaporation is the cold produced by it; the consequence of the absorption of heat attending the conversion of water into vapour. This depression of temperature must evidently be as the evaporation; or rather the momentary depression will be in proportion to the rapidity of the evaporation. The momentary depression is equal to the momentary increment of heat which would take place were the cooling power of evaporation suspended, and the moistened bulb thermometer allowed to assume the temperature of the air. This is known to be as the 1.233 power of the total depression: the evaporation will then be as the 1.233 of the depression." But the evaporation is (according to DALTON), as the tension of the evaporating surface *minus* the tension of the vapour in the air (= 0 in dry air:) then finally this tension will be as the 1.233 power of the depression: or

$$d\,m = \sqrt[1.233]{f' - f''}$$

m being a co-efficient depending on the latent heat of air and the ratio of the evaporation to the weight and surface necessary to produce a fall of one degree; which Captain HERBERT deduced from the experiments made at Benares. The complete formula, at 30 inches, for dry air becoming

$$D = \sqrt[1.233]{\frac{L f'}{6.056}}$$

in which L (proportion of mass of water to the vapour required to be evaporated to produce a fall of 1°) is derived from a table published in the Oriental Magazine, September 1827; it varies from 898 at 40° to 1005 at 90° and 1250 at 1800. The divisor 6.056 would require to be diminished to 5.4 to suit the present experiments, but neither would the formula then agree so well as the more simple one of LESLIE and others. The fact is that the experimental curve is of so simple a nature, that any geometric series of moderate divergence may within limits be accommodated to it by proper co-efficients: thus my

own formula was merely an empiric one formed to represent the experimental data of Benares and those of Gay Lussac in the most ready manner, expressing the depressions in terms of the temperature of the air: the former increasing geometrically with arithmetical increments of the latter, I found $d = \frac{t'^{1.275}}{8.91}$; but this does not correspond at all with the higher depressions now ascertained experimentally, though it suits those of the former series. We may, therefore, reject it without further regard: nor need we pause to consider Berzelius' more simple rule, founded, he says, on the experiments of August, Bonenberger *and others*, viz. that the temperature of the wet-bulb is always an arithmetical mean between that of the air and the dew point, or $t'' = 2t' - t$, which, except at certain points of the scale, is utterly erroneous.

We now come to Professor Apjohn's formula, which will be found not to differ essentially from those of Leslie or Gay Lussac. It is $f'' = f' - m\,d$ (at 30 inches pressure) where m is a co-efficient as usual "depending upon the specific heat of air, and the caloric of elasticity of its included vapour," of which the arithmetical value deduced from received data is .01149 or the equivalent vulgar fraction $\frac{1}{87}$ at 50° Farh. Now in the case of extreme dryness assumed for our comparison, $f'' = 0$; therefore $d = 87\,f'$; an expression entirely agreeing in form with Leslie's, but rather smaller in amount, and more nearly, as will be seen, in accordance with the experiments of Tables II and III.

Dr. Hudson arrives, from different premises, at nearly the same method as Professor Apjohn*. He calculates a column of the "relative quantities of heat (Q) necessary to supply vapour of saturation to dry air at each degree of wet-bulb temperature, t', and then finding from experiment at one point ($t' = 61°$) the actual depression (51.124 Apjohn), the depressions at other degrees he assumes to be direct proportionals, or Q (at 61°) : Q′ :: 51.124 ; D.

Now it is evident that in this equation, as in most of the preceding, Q (whence D is directly derived) necessarily depends on the aqueous tension, f', affected by the indispensable co-efficient of the latent heat of water, vapour and air, or as Dr. Hudson deduces from Despretz's values, $Q = \frac{1168 - t \times 22\,f'}{448 + t}$†. For

* Phil. Mag. Oct. 1835, p. 257.

† If the theory which makes the sum of the latent and thermometric heat for gaseous bodies a constant quantity be correct, Dr. Hudson's expression does

ordinary temperatures, Q on an average will be found $= 50\ f'$ and D is assumed from APJOHN's experiments $= \frac{51.\ 124\ Q}{25.9} = 1.9\,Q$; so that by this formula (at 30 inches,) $D = 98\ f'$, nearly; being a little in excess of LESLIE's original formula. This is attributable to APJOHN's single experimental depression assumed as the basis of the whole calculus being somewhat too great.

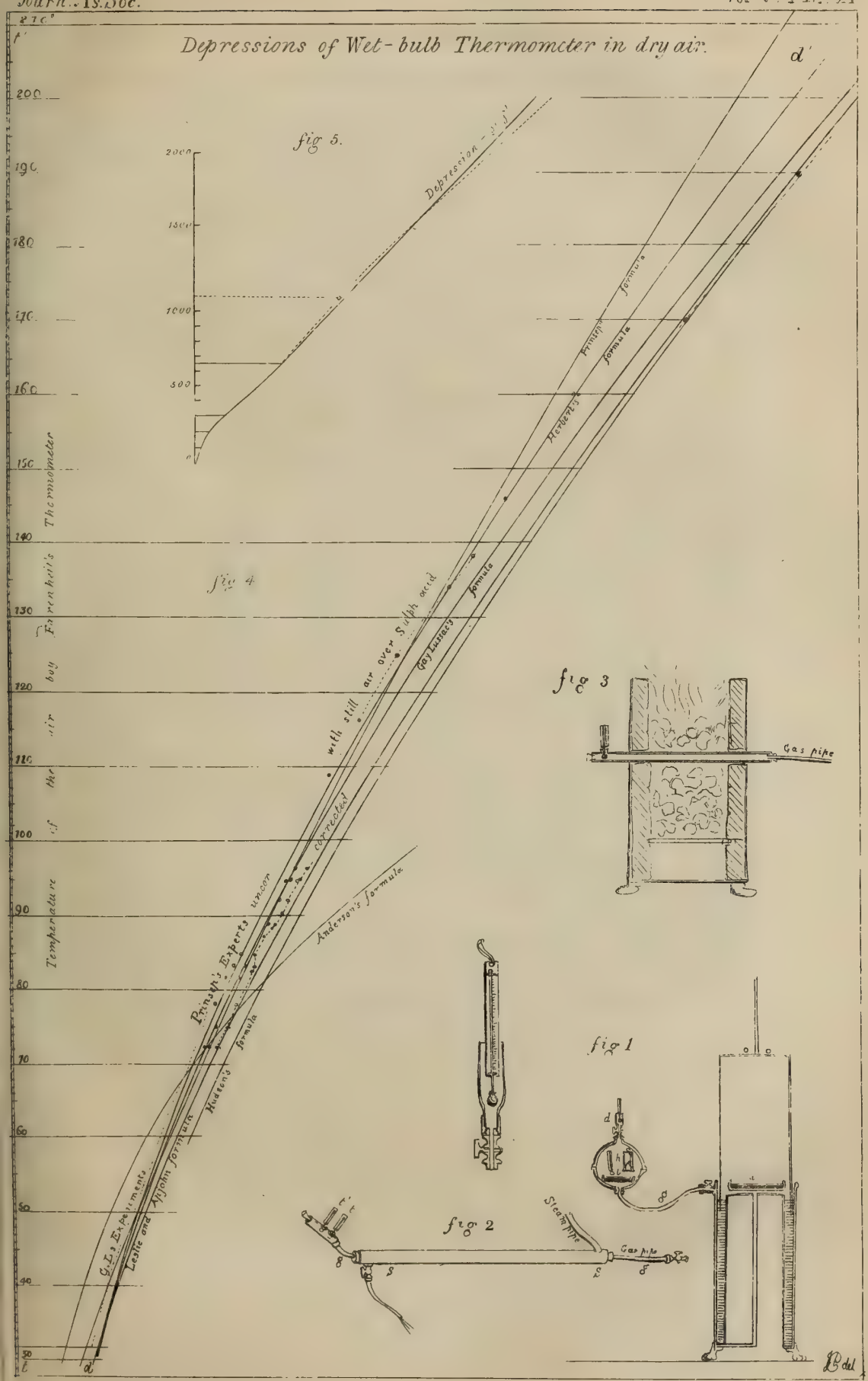
It cannot be said after the preceding list, that the wet-bulb theory has been neglected. On the contrary, it may be rather feared that the researches of its earliest investigators, particularly those of LESLIE and GAY LUSSAC, have been neglected; for it is certain that their formulæ are nearly as well adapted to the actual phenomena as any that have been since suggested. This cannot be more strikingly exemplified than in the accompanying diagram, (Pl. XXI.) which has been filled up from the preceding data. The abscissæ represent the temperatures *(t)*, and the ordinates the maximum depressions in dry air (D). The experimental determinations are shewn by dots*, and the principal theoretical curves delineated, are distinguished by the name of their authors.

The following table also embraces a comparative view for every ten degrees of temperature, the experimental entries being adapted by interpolation from the observations before set forth.

not seem open to objection. The *volumes* of air at different temperature being as $\overline{448 + t}$ directly: the *densities* are as $\overline{448 + t}$ inversely; and for any other pressure $\frac{f}{30}$ the density of air at t will be $\frac{660f}{448 + t \times 30} = \frac{22f}{448 + t}$. Further, allowing the atomic theory of volumes, the *density of vapour* at t will be $= \frac{.625 \times 22f}{448 + t}$. Compounding this expression with that of the latent heat of vapour at t which is $1168 - t$ (being 956 at 212°); we have as above the quantity of heat necessary for the vapour of saturation at $t = \frac{\overline{1168 - t} \times 22f'}{448 + t}$. The author has steered clear of what he considers the disputed points, of the *capacity* of air and vapour for heat: but it may be reasonably doubted whether the assumption of the equality of $l + t$ be a whit more tenable.

* In the portion of the curve marked "PRINSEP's experiments," both the uncorrected and the corrected observations are entered; the latter, distinguished by a dotted line passing through them, are alone to be attended to. The corrected places of the sulphuric acid experiments have been omitted, because they are necessarily doubtful. The *flexure* of GAY LUSSAC's curve seems to be the most suitable to experiment, were its ordinates a little increased.

Depressions of Wet-bulb Thermometer in dry air.



TAB. III.—*Comparison of various formulæ for the depression of the wet-bulb thermometer in a current of dry air, with the results of experiment.*

Temperature of the current of dry air.	Temperature of the wet-bulb therm.	Observed depression.	Calculated depression for Bar. 30 inches.								Error of ditto from observation.
			Observer's name.	Leslie's formula $D = 96\,f'$.	Gay Lussac's form. $D = \frac{2247\,f'}{30 - f'}$	Prinsep's formula $D = .0112t^{1.275}$.	Herbert's formula $D^{1.233} = 156.8f'$ (nearly.)	Hudson's formula $D = 98\,f'$ (nearly.)	Apjohn's formula $D = 87\,f'$	Formula adopted for tables $D = 84\,f'$.	
t	t'	D		D	D	D	D	D	D	D	
°	°										
30	20.8	9.2	G.	11.7	9.2	8.6	11.0	..	10.8	10.6	
40	27.3	12.7	G.	14.9	13.1	12.4	13.5	..	14.0	13.6	
50	33.9	16.1	G.	18.6	16.4	16.4	16.7	..	17.6	17.1	+0.1
	33.0	17.0	A.								
60	40.1	19.9	G.	22.9	20.6	20.7	20.0	23.4	21.8	21.3	—0.3
	38.4	21.6	A.								
70	46.0	23.7	G.	27.6	24.9	25.2	24.3	28.1	26.4	25.9	+0.2
	44.9	25.7	P.								
80	..	30.6	P.	32.7	29.7	29.9	28.4	33.2	31.3	30.8	+0.2
90	..	35.5	P.	38.2	34.6	34.7	33.1	38.4	36.5	36.0	+0.5
100	..	40.8	P.	44.0	40.0	39.7	38.2	44.0	42.2	41.6	+0.8
110	..	47.8	S.	50.0	46.0	44.9	43.5	49.0	48.3	47.6	—0.2 ?
120	..	54.1	S.	56.4	52.0	50.2	49.2	56.0	54.5	53.9	—0.2 ?
130	..	60.9	S.	63.1	58.6	55.6	55.1	62.2	61.1	60.5	—0.4 ?
140	..	68.2	S.	70.0	65.5	61.0	61.3	..	68.0	67.3	—0.9 ?
150	..	74.8	C.	..	72.4	66.7	..	..	75.1	74.3	—0.5
160	..	81.3	H.	..	79.4	72.5	..	..	82.3	81.5	+0.2
170	80.0	90.0	P.	..	87.0	78.2	79.8	90.4	89.6	88.9	—0.1
180	80.4	99.6?	P.	..	94.6	84.2	..	..	97.2	96.5	—3.1 ?
190	85.0	105.0	P.	107.0	102.0	91.2	98.	102.0	105.0	104.3	—0.7
200	..	..	..	..	109.5	96.4	..	..	112.0	111.1	
210	..	..	..	..	..	102.4	..	..	120.0	118.	
?	145.0	..	P.	627.	625.	105.	308.	487.	567.	552.	

[The letters in column 4 denote, G. GAY LUSSAC; A. APJOHN; P. PRINSEP; S. experiments tried at Benares, by suspending the wet-bulb thermometer in a half filled bottle of sulphuric acid; these have been augmented 10 per cent. on insertion :— C. and H. Carbonic acid and Hydrogen gas heated in the steam pipe.]

The last line may be looked upon, in some measure, as the test line of the various formulæ: for, the hot current of air from the furnace, we have seen, barely melted lead and boiled mercury; its temperature, therefore, could not much exceed 660 Farh. Let us see what it would be according to the principal formulæ depending upon the aqueous tension at t', which, when $t' = 145°$ is 6.53 inches by DALTON.

LESLIE's formula gives $6.53 \times 96 + 145 = 772°$
GAY LUSSAC's (retaining f') $6.53 \times 95.7 + 145 = 770$
(omitting $-f'$ in divisor) $6.53 \times 782 + 145 = 655$
HUDSON's formula gives $487 + 145 = 632$
APJOHN's, ... $6.53 \times 87 + 145 = 702$
Formula deduced from my expts. $6.53 \times 84 + 145 = 697$

ANDERSON's, HERBERT's, and my former formulæ are too much at variance at this high point to be worthy of quotation. The rest

agree remarkably well, and it does not materially signify, nor is it perhaps possible to certify which multiplier is to be preferred. Professor APJOHN's has the merit of coinciding precisely at the temperature of 190° with my steam experiment; but for the range of lower and more practical temperatures it is perhaps slightly in excess. The simpler expression of "one-eightieth of the depression = the aqueous tension at t" would there be nearer the mark; and would be easier of application. From my own experiments I deduced a mean of $D = 84\,f'$ with which I constructed the table at the conclusion of this paper, but I must in fairness acknowledge that its preference to Professor APJOHN's rule is nearly evanescent in practice.

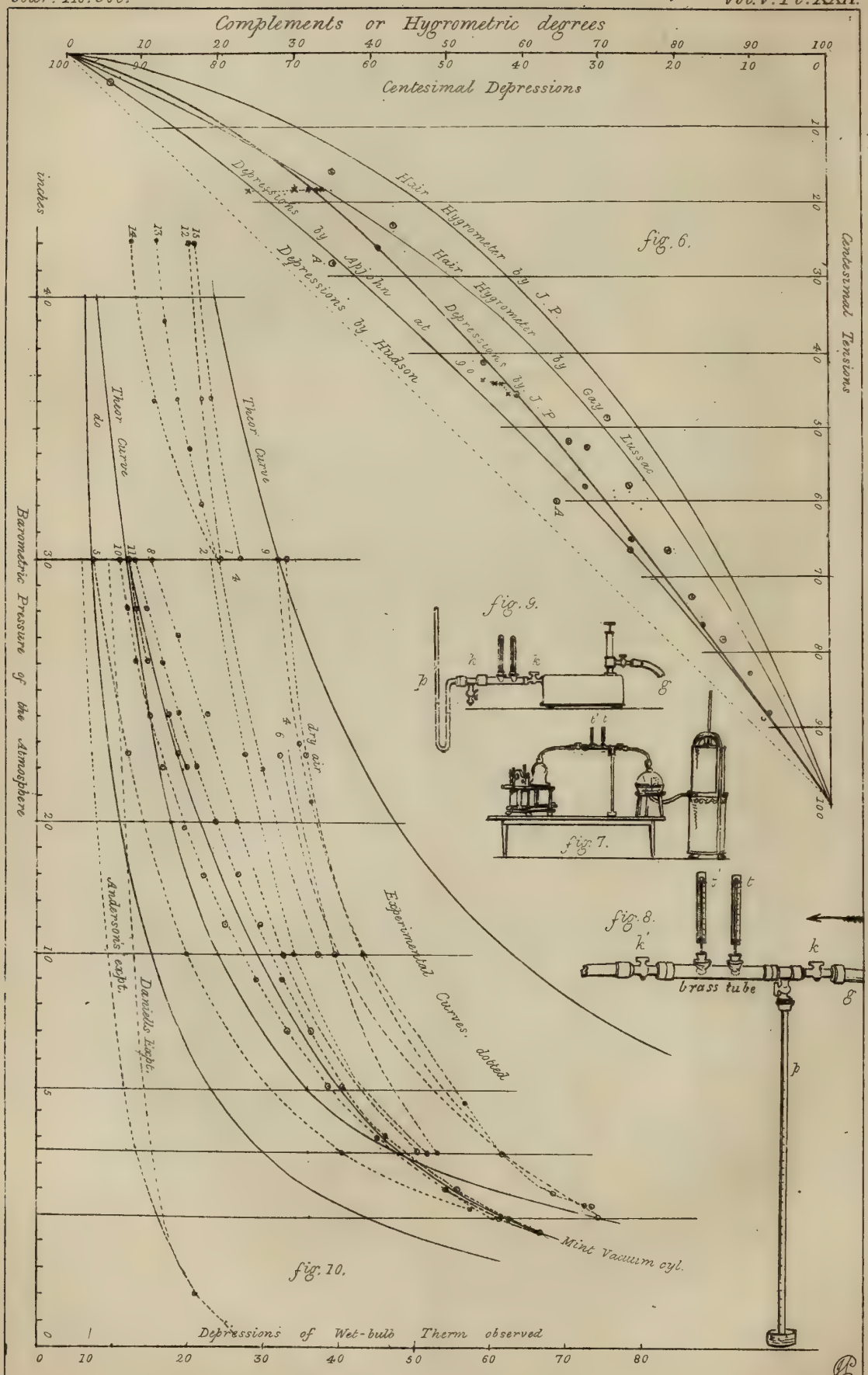
§ 2.—*Value of depressions less than the maximum, in centesimal hygrometric tension.*

We are now arrived at the second subject of inquiry, which is in fact of more practical importance than the first, since it includes every observation that can be made in an atmosphere never reduced to a state of absolute siccity.

The simplest condition of the case of *intermediate depressions* would be that assumed by Dr. HUDSON, viz., that the maximum depression being divided into 100 parts, each part should indicate one hundredth of the moisture of saturation at the given temperature, or $D : d :: f' : f' - f''$.

But such a law is not found to prevail in reality: nor is it analogous to the course of nature that it should exist in the case of the wet-bulb thermometer, when the hair-hygrometer and the law of evaporation require different ratios. It is more consonant with theory*, as it proves to be with practice, that the tendency to evaporation, and the cold consequent upon it, should increase in a geometrical ratio to the dryness of the air.

* The depressions will, *ceteris paribus*, be less, the more aqueous vapour is previously contained in the air, because the specific heat of a given volume of vapour being .529 (or .847×.625) while that of air is .267, the specific heat of any mixture of the two must exceed that of air alone. But the curvature imparted to the line of depressions from this cause may easily be shewn to be trifling. Thus at the temperature of 80° where $f = 1.00$ inch; the capacity of dry air being c, that of moistened air will be $\frac{c \times p - f'' + c' \times f''}{p}$; whence, calling $c = 1$, for saturated air we should have the specific heat 1.053; and for half-saturated air, 1.031; and the depressional degrees at those points will be inversely so much less than those at the dry extremity of the curve. Were the other agents easily evaluated, we might through this means verify the specific heat of aqueous vapour.


Complements or Hygrometric degrees
Centesimal Depressions
Hair Hygrometer by J. P.
Depressions by A. Ajjohn
Depressions by Hudson
Hair Hygrometer by Gay Lussac
Depressions by J. P.
fig. 6.
Centesimal Tensions
inches
Barometric Pressure of the Atmosphere
Ther Curve
do
Ther Curve
dry air
Experimental Curves, dotted
Anderson's expt.
Daniells Expt.
Mint Vacuum cyl.
fig. 10.
Depressions of Wet-bulb Therm observed
fig. 9.
fig. 7.
fig. 8.
brass tube

Before proceeding to detail the experiments directed to the elucidation of this point, it may be as well, as we have already become acquainted with the theoretical expressions of other authors for the *maximum*, to see how they also bear upon the *intermediate* depressions.

The formula of M. Gay Lussac makes no provision for aught but the maximum depression; but the omission may be readily supplied on the same simple principle as has been adopted by Professor Apjohn; namely, by the addition of $-f''$, the aqueous tension at the dew-point, to f': thus, by the latter author, in all cases $d = 87\,f' - f''$.

At first sight, this would seem a simple arithmetical ratio, like Dr. Hudson's, but inasmuch as the tensions *(f)* are themselves in geometrical ratio to the temperature *(t)*, the same parabolic curvature will extend to the centesimal depressions; or $f' - f''$ will follow some low power of $t - t'$.

Captain Herbert's rule has the same happy introduction of f''. We have therefore but two theoretical enunciations to put to the test of comparison with experiment: for which purpose I will now bring forward such evidence as I have accumulated. In this branch of inquiry materials are so numerous in my registers kept at Benares and Calcutta, that it becomes expedient to gather selected data into groupes adapted to elucidate various points of the hygrometric scale. Moreover, as unity, or the maximum depression, varies in amount at each temperature, all observations must be brought to common centesimal terms before they can be compared in the manner which is best adapted to give a quick perception of the relation of such phenomena; namely, by a diagram, as in Pl. XXII. First, then, to enumerate the data afforded by method 5, or comparison with the dew-point, of which, in addition to my Benares observations, I have profited by the presence of an American ice-house on the banks of the Húghlí to collect an accurate series made thrice per diem in the hottest period of our Calcutta year.

Tab. IV.—*Comparison of intermediate Depressions with aqueous tensions, ascertained by the dew-point method, at Benares.*

Number of observations agreeing closely in their respective particulars.	Temp. of air. t °	Wet-bulb. t' °	Dew-point. t'' °	Centesimal tension. $f'' \div f$	Depression. $t-t'$ or, d	Complement cent. depn. $\frac{D-d}{D}$	Tabular centesim. tension deduced.	Error.
7 Obs. mean,	85.0	81.5	79.4	.83	3.5	89	.84	+01
12 Obs. ditto,	87.5	81.8	78.7	.76	5.7	83	.76	0
12 Obs. ditto,	90.0	80.5	75.7	.65	9.5	74	.64	—01
6 Obs. ditto,	94.0	81.0	73.2	.52	13.0	66	.54	+02
6 Obs. ditto,	92.5	75.5	64.5	.41	17.0	55	.40	+01
13 Obs. ditto,	88.2	67.3	42.9	.23	20.9	43	.26	+03
8 Obs. ditto,	92.6	68.3	36.4	.16	24.3	35	.20	+04

Second series, from observations in Calcutta.

	t	t'	t''	$f''\div f$	d	$\frac{D-d}{d}$	*Tab.*	*Err.*
6 Obs. open air,	82.1	79.4	78.1	.88	2.7	92	.88	0
6 Obs. ditto,	84.6	79.9	76.7	.78	4.7	86	.80	+02
9 Obs. ditto,	85.6	79.7	75.5	.73	5.9	82	.75	+02
15 Obs. ditto,	87.7	80.2	74.6	.66	7.5	79	.70	+04
2 Obs. ditto,	96.0	85.6	78.3	.58	10.4	74	.64	+06
3 Obs. ditto,	93.8	82.9	71.2	.49	10.9	71	.60	+11?
4 Obs. ditto,	87.3	76.4	67.3	.53	10.9	68	.58	+05
3 Obs. ditto,	97.1	80.8	71.8	.45	16.3	59	.45	0
6 Obs. ditto,	97.3	73.6	55.5	.26	23.7	41	.26	0
1 Steam pipe,	19.0	92.5	74.3	.04	97.5	6	.04	0
3 Vacuum-pipe	92.8	80.8	74.8	.58	12.0	68	.57	—01

Third series, extracted from other observations.

7 Obs. by *Herbert* on river Ganges,	91.4	82.1	78.1	.66	9.3	74	.65	—01
6 Obs. by *Apjohn*,.....	70.0	60.8	54.5	.60	9.2	64	.52	—08
4 Obs. *ditto*, (heated air,)	93.2	69.0	53.7	.28	24.2	35	.22	—06

In the following series the air was dried to two fixed points of hygrometric tension by means of sulphuric acid, of which the drying power was known beforehand by the table which I published, from careful experiment, in my note on the hair hygrometer before alluded to; but I preferred verifying those determinations by fresh measurement of its barometric tension, in the mode I had adopted to correct the tables of aqueous tension during the past year; namely, by moistening a barometer tube with the acid solution, and mounting it in the ordinary manner. The daily readings registered in my monthly tables for May-June afforded a more accurate average than a cursory trial could have yielded; but the result was in perfect accordance with my former determination*.

Fourth series—current of air partially dried.

Number of observations in similar circumstances.	Temp. of air. t	Wet-bulb. t'	Known cent. tension.	Hair Hygrom.	Depression. $t-t'$ or, D	Complement cent. dep. $\frac{D-d}{D}$	Tabular centes. tension.	Error.
	°	°			°			
2 Obs. with gasometer current, Sulph. acid, 1.344, ...	90.2	75.3	.45	75	14.9	58	.45	0
2 Obs. ditto, ...	87.2	72.1	.44	74	15.1	56	.43	—01
2 Obs. ditto, ...	90.3	74.4	.44	74	15.9	56	.43	—01
1 Obs. ditto, ...	96.4	79.4	.44	74	17.0	57	.44	0
1 Obs. ditto, ...	94.0	76.6	.43	73	17.4	54	.40	—03
2 Obs. sulph. acid, 1.48, ...	88.8	65.2	.18	43	23.6	33	.20	+02
1 Obs. ditto, ...	87.7	61.1	.18	43	26.6	24?	.12	—06
1 Obs. shorter tube,	84.4	62.0	.18	43	22.4	32	.18	0
2 Obs. brass tube,..	87.8	64.3	.18	42	23.5	30	.17	—01

* It will be seen by the Meteorological Register for May 1836, that pure sulphuric acid caused the barometric column to be higher even than a boiled tube. This must be attributed to capillarity, which is negative with mercury, but acts in an opposite sense with acid or water. No allowance is made for capillarity in my registers.

On inspection of the columns of complementry centesimal depression and centesimal tension in all the foregoing tables, the constant excess of the former is their first predominate feature; whence the certain conclusion that the ratio is not *direct*. But to arrive quicker at a conclusion of what it may be, let us view the position of the whole series in diagram 6, Pl. XXII. Here the base line designates the hygrometric tensions $f'' \div f$ and the ordinates denote the corresponding centesimal depressions $\overline{D-d} \div D$. If amid such a straggling and scattered nebula it be allowable to trace a normal line, the curve D *d* will have a preference over any other. Pursuing its dubious course, it passes through the two principal test groupes, upon which more dependence ought to be placed than upon isolated comparisons with the dew-point in still air. Now this line D *d* nearly coincides with the curve I suggested in 1829, from my Benares experiments, making H (or $f'' \div f$) follow the ratio of $\overline{D-d}^{1.5}$; or, calling D = 100, $H = \frac{\overline{D-d}^{1.5}}{100}$; in other words, the *centesimal tension* is as the difference of the actual and the maximum depression raised to the 1.5th power; a form obviously very convenient to be worked by logarithms. This formula has been used for constructing my general table; and its errors may be judged of by the last two columns of the preceding experiments: but it need by no means supersede the elegant formula $d = 87 f' - f''$ when the table is not at hand. The curve corresponding to the latter formula at 90° is also entered in fig. 6. At lower temperature it will have less flexure.

On the same diagram I have traced the curve of the hair-hygrometer indications, both according to Gay Lussac's data and those of my original plate in Brande's Journal, on purpose to shew that the *depression curve* passes between the two near the summit:—it was hence I derived the rule for correction of the rough maximum depressions, (Table I. II.) by taking it in the direct ratio of the hair-hygrometer indications: and the near accordance of the maxima so deduced, with the observed maxima in dry air, is an additional testimony in favor of the assumed parabolic curve.

It seems an unmerciful increase of the tax upon my reader's patience to extend this train of comparison further: yet it would be hardly fair to omit any thing that can tend to elucidate the subject or assist future investigation: I will not, therefore, forego, through a false and unphilosophical delicacy, the insertion of an abstract I had prepared for my own satisfaction, of three years' comparative deductions from the wet-bulb and hair-hygrometer. It detracts somewhat from its value, that a constant index error of 4 degrees has to be substracted from the readings of the hair-hygrometer during the period in ques-

tion. This I only discovered on checking all the instruments, as is my custom, before commencing the present experiments; but the hygrometer has been untouched during the interval, and as its scale embraces the 100 degrees with as much sensibility as when it was constructed in 1825, there can be no hesitation in making the required correction throughout. The extreme points of this instrument should indeed be verified at least once in a year; as the index point is, from its delicate construction, easily shifted 2 or 3 degrees.

TAB. V.—*Comparison of the monthly averages of the Wet-bulb depression, and the Hair-hygrometer, for 3 years in Calcutta.*

		At 10 A. M.			Tension,		At 4 P. M.			Tension,	
		Temp.	Dep.	Hyg.	by Dep.	by Hyg.	Temp.	Dep.	Hyg.	by Dep.	by Hyg.
		°					°				
Jan.	1833	68.0	8.4	81	.55	.61	72.4	11.6	74	.47	.49
	1834	67.5	6.4	83	.64	.64	71.1	9.2	76	.53	.52
	1835	67.8	8.0	80	.56	.59	70.7	11.5	70	.42	.43
Feb...	1	74.0	8.2	82	.60	.63	78.7	12.7	74	.44	.49
	2	74.0	7.3	86	.64	.70	77.8	11.6	77	.48	.54
	3	74.3	6.0	87	.70	.72	76.6	10.2	76	.52	.52
Mar...	1	83.5	9.8	81	.59	.59	89.2	17.3	66	.37	.43
	2	82.3	7.5	86	.67	.68	86.7	12.2	76	.52	.52
	3	79.8	8.3	85	.63	.66	83.6	13.0	70	.47	.44
April,	1	87.5	6.2	88	.75	.74	91.6	10.8	79	.60	.57
	2	86.5	8.8	84	.65	.67	93.2	13.8	75	.52	.51
	3	84.6	7.6	86	.68	.70	88.1	12.7	75	.52	.51
May, .	1	87.5	6.1	91	.75	.80	90.0	8.2	86	.67	.70
	2	90.7	7.9	86	.69	.70	94.6	10.9	80	.58	.59
	3	86.8	6.5	89	.74	.76	88.3	7.5	86	.79	,70
June, .	1	90.5	6.4	88	.75	.74	92.8	8.1	82	.70	.66
	2	87.0	4.8	91	.80	.80	87.8	6.1	90	.75	.78
	3	86.1	5.6	87	.76	.72	87.4	6.9	85	.72	.68
July, .	1	86.3	4.0	91	.83	.80	87.9	4.6	90	.83	.78
	2	86.6	5.1	91	.80	.80	88.0	6.0	90	.76	.78
	3	82.7	4.0	88	.77	.74	85.3	4.8	88	.80	.74
Aug...	1	85.0	4.1	92	.82	.82	86.8	4.9	89	.75	.76
	2	85.1	4.2	92	.82	.82	86.7	5.3	91	.78	.80
	3	84.0	4.0	92	,82	.82	85.0	4.3	91	.81	.80
Sept..	1	86.3	4.4	91	.76	.80	88.3	5.5	88	.82	.74
	2	85.9	4.9	92	.75	.82	86.4	5.9	91	.76	.80
	3	83.7	4.8	91	.80	.80	85.0	6.8	89	.71	.76
Oct...	1	85.2	5.6	87	.76	.72	86.8	7.6	83	.69	.65
	2	82.9	4.0	83	.82	.84	83.9	5.0	91	.79	.80
	3	83.3	6.8	87	.71	.72	85.1	9.3	82	.61	.63
Nov..	1	79.	6.9	84	.69	.66	82.1	10.1	77	.57	.54
	2	79.2	7.5	85	.66	.68	79.4	10.1	78	.55	.56
	3	75.6	7.7	85	.64	.68	77.9	10.0	79	.55	.57
Dec..	1	71.7	5.8	85	.70	.68	74.3	7.2	82	.65	.63
	2	72.4	6.1	87	.67	.72	75.7	9.0	81	.57	.61
	3	69.8	6.1	84	.68	.66	72.0	8.9	78	.55	.56
Means,		81.2	6.1	86.8	.71	.72	83.8	8.9	81.5	.63	.63

The actual tension of vapour in inches, found by multiplying DALTON's maximun tension of vapour at *t* by the percentage here given, is,

at 81°. 2= 1.040 × .71 = .738; at 83°.8=1.128 ×.63=. 711 (or .716 at 81°.2) being at the two periods of the day, on an average, very nearly equal; though, relatively, the air is much drier in the afternoon.

A similar comparison to that afforded by the above table would have been published with my journals for 1825-6 in the Philosophical Transactions for 1827, had the registers been allowed to stand as they were; but the columns of aqueous tension were struck out, although from the elaborate care I had taken in valuing the degrees of my hair hygrometer they were entitled to some reliance. It is, however, not worth while to republish them, as the wet-bulb instrument was then situated outside and the hair hygrometer inside the house*, and the two columns are not strictly comparable. One little table, however, deduced from four years' daily experiments at Benares, which was also suppressed at home, I think likely to prove useful, while it bears directly on the wet-bulb theory, and exemplifies the truth of the assumption of its immediate dependence on f'. This table shews the actual evaporation in depth per month, as measured by a small evaporameter suspended in the open air, for the opposite extremes of the year. The instrument is described in the fifteenth volume of the *Asiatic Researches*. I have collected on the left hand the observed quantities, and have now inserted on the right the theoretical numbers which should express the ratio of evaporation. The results are even more satisfactory than could have been anticipated; and lead to the following very simple rule to find the amount of evaporation roughly in inches per diem. "Multiply the aqueous tension at the wet-bulb temperature by the observed depression in degrees, and divide by 34." Omitting the latter operation, the product will express in round terms the evaporation per month in the open air, or in a moderate breeze.

TAB. VI.—*Rate of Evaporation and simultaneous depression observed at Benares.*

Months.	Year.	Temp. of air. t. °	Wet-bulb. t' °	Depression. d °	Obsvd. Evaporation per month inches.	Ditto per diem inch.	Aqueous tension, f'.	Depression × tension, $d \times f'$.	Calculated daily evaporation, $\frac{d \times f'}{34}$
April and May,	1823	88.0	68.9	19.1	13.9				
	1824	93.1	71.8	21.3	11.9				
	1825	92.3	74.2	18.1	14.7				
	1826	90.4	69.8	20.7	15.1				
	Means	91.2	70.9	20.3	13.9	0.463	0.748	15.18	0.447
March,	1823	79.8	62.0	17.8	8.7				
	1824	81.4	66.5	13.8	6.7				
	1825	75.1	64.7	11.4	4.0				
	1826	80.8	63.4	16.4	9.8				
	Means	79.4	64.1	15.3	7.3	0.243	0.599	8.16	0.240

* The Calcutta Oriental Magazine, 1827, contains the whole paper.

							f'	$d \times f'$	$\frac{d \times f'}{34}$
July and August,	1823	80.5	78.2	2.3	2.3				
	1824	85.6	82.1	3.5	2.6				
	1825	86.9	81.3	4.6	4.4				
	1826	84.4	80.8	3.6	3.6				
	Means	84.4	80.6	3.8	3.2	0.107	1.020	3.88	0.114
December and January,	1823	60.1	55.7	4.4	2.3				
	1824	61.8	56.6	5.2	4.0				
	1825	63.5	58.3	5.2	5.6				
	1826	63.8	54.9	8.9	3.1				
	Means	62.3	56.3	6.0	2.5 per. an.	0.085	0.462	2.77	0.081
The whole twelve months,	1823	76.4	68.1	8.3	65.6				
	1824	80.0	71.2	8.8	60.5				
	1825	80.0	71.1	8.9	67.1				
	Means	78.9	70.1 permonth	8.7	64.4 5.37	0.179	0.729	6.34	0.186

I have, as yet, had no opportunity of applying the principle ascertained from this table, to the circumstances of other places*.

§ 3.—*Influence of the Barometer on the Wet-bulb depression.*

All philosophers agree in rating the influence of atmospheric pressure on depression as inversely proportional to the height of the barometer; so that when the depression under a pressure of 30 inches is known, it may immediately found for any other pressure by multiplying d into $\frac{30}{p}$, p being the observed height of the barometer.

That the evaporation increases with diminution of pressure nearly in the above ratio, has been proved by various experiments; and it might confidently be anticipated, from the necessary connection between the evaporation and the refrigeration, (as exemplified in the concluding table of my last section,) that the same law would prevail in the depressions: but the only two experiments directed to this point that I am acquainted with, lead to an opposite conclusion. These were cited in my former paper: but as they are not accessible to many readers, I will here repeat them. Mr. DANIELL's experiment will be found in Jour. Roy. Inst. XVII., and Mr. ANDERSON's in BREWSTER's Cyclopedia, Art. Hygrometry.

Barometric pressure.	Ratio.	Evaporation in grains by Daniell.	Depression of wet-bulb by Daniell.	Increment.	Depression of wet-bulb by Anderson.	Increment.
30.4	1	1.24	9	0	5	0
15.2	$\frac{1}{2}$	2.97	12	+3	9	+4
7.6	$\frac{1}{4}$	5.68	15	+3	13	+4
3.8	$\frac{1}{8}$	9·12	18	+3	18	+5
1.9	$\frac{1}{16}$	15.92	21	+3		
.9	$\frac{1}{32}$	29.33	24.5	+3.5		
.5	$\frac{1}{64}$	50.74	26	+1.5		

* The tables now published by the astronomer at Madras will afford good data; but his mode of measurement must be first known, as his evaporations seem double of my own.

Now in these instances the evaporation certainly followed the inverse pressure law; but the depression was made to receive only a constant arithmetical increment for each geometrical decrement of the pressure; in accordance with which I assumed that the proper correction for variation of pressure should be $d\sqrt{\frac{30}{p}}$ rather than $d\frac{30}{p}$; and even this would require a different co-efficient to make it suit the two cases quoted above. Under such an uncertainty as to the real amount of this important correction, I was induced to direct a fresh series of experiments to this particular object; and as my results differ greatly from what has preceded, it is incumbent on me to describe my process a little in detail.

I first prescribed to myself the necessity of working with a current of air as similar as might be to that of the maximum series, as without such a precaution it would be impossible to ensure the permanent hygrometric status of the air in contact with the wet-bulb. The bell glass of an air-pump, under which I imagine the experiments of Daniell and Anderson to have been conducted, could not possibly fulfil this indispensable condition, since a partial halo of moisture would encircle the bulb of their thermometer;—nor do they appear to have used a hair hygrometer to inform them how far this might be the case. Mr. Daniell it is true had a dew-point instrument fitted into the side of the glass receiver, but for slight aqueous tension this instrument becomes wholly useless. The extent to which his air was dried can be calculated pretty well from his own datum that the depression at 50° was nine degrees, which by my table would indicate centesimal tension ·30: or by Apjohn's formula $\frac{.263-(9\div 87)}{.357}=\cdot 42$ in the latter case requiring a cold of 8 degrees, and in the former of 16, below the freezing point to produce deposition.

But to return to my own experiments:—

In place of the short open glass tube connected with the gasometer and glass balloon in which the wet-bulb was before exposed to the current of air, (fig. 1,) a thin horizontal brass tube (fig. 7) was substituted, having two lateral apertures for the admission through corks, air-tight, of the dry and wet thermometer bulbs (t, t'). From the same brass tube descended a glass barometer tube (p) into a reservoir of mercury, similar to the gage of an air-pump, for marking the actual pressure close to the thermometers. The other end of the tube was conducted by a flexible pipe F to the receiver of an air-pump, where a continual vacuum could be kept up by pumping without intermission during the course of an experiment.

and by manœuvring the stopcocks *(k, k')* at the two ends of the brass tube, the pressure could be maintained at any point, and the draft of air regulated until the temperature of the wet-bulb had been satisfactorily ascertained.

Finding that the labour of working the pump was rather irksome in a climate of 95°, I afterwards availed myself of the vacuum engine of the coining-press room in the Mint to relieve me from this duty. In the pipe leading from the twelve recoil-pumps of the presses a vacuum of about (or rather 30—27) inches is constantly maintained by the steam engine, so that by adapting the tube F to this with a stopcock, I was enabled to regulate the pressure, and prolong each interval with the utmost ease and comfort.

It will be seen from the table of experiments below, that *by employing a current of dry air* the freezing point was readily attained under a pressure of $7\frac{1}{2}$ inches, while the dry thermometer, only one inch from it, marked 92° : whereas all who have tried LESLIE'S process for freezing have found it exceedingly difficult in the hot weather of this country to produce ice with a vacuum nearly perfect. The reason has been already explained : in the latter case the partially moist atmosphere arrests the progress of refrigeration ; whereas in the latter, the vapour rising from the evaporating surface is continually removed ;—it is, in fact, like sitting under a punkah or without it, an illustration that requires no comment to an Indian reader ! Of such influence is the motion of the air in the experiment, that, as will be seen presently, a cold *much below the freezing point* may be attained under a pressure of $4\frac{1}{2}$ inches, *with common air at* 92° *containing sixtenths of its vapour of saturation* (dew-point = 75°) and without the aid of sulphuric acid, or any other artificial means of previously drying it ! This unexpected result opens a wide field for speculation as to the possibility of modifying the apparatus of LESLIE for the artificial production of ice ; and I hope, when leisure permits, to resume the thread of this collateral and highly interesting discovery. The nature of the problem teaches us *à priori*, that if a temperature of 20° can be attained under a pressure of $4\frac{1}{2}$ inches, the cold at two inches ought to be many degrees below zero of Fahrenheit's scale !

Out of four experiments made with the air-pump, and eight with the Mint vacuum engine, it will be sufficient, after quoting the numerical results of the whole, and referring to the accompanying diagram (Pl. XXII. fig. 10.) for a comprehensive view of their general bearing, to select two or three of the most regular examples for analytical discussion.

TAB. VII.—*Depressions under diminished pressure.*

	Temp. of air.	Hyg. tens.	Temp. of wet-bulb, under a pressure of 30.	22.5	15.	7.5	6.0	5.5	5.0 in.
1. Expt. with air pump, air dried by Sul. Ac. 1.48,	84.0	.18	61.0	..	56.0	48.			
2. Ditto, corks fitted closer,	84.7	.18	..	..	51.0	..			
3. Brass tube, better fitted,	84.4	.18	62.0	57.0	50.3	32.0			
4. Ditto, careful expt...	87.8	.18	64.3	55.0	49.0	35.0			
5. Common air, in Mint vac. tube; dew-point 79°.5,	88.5	.75	81.3	76.4	69.0	48.0	..	32.0	
6. Partially dried, hair-hyg. in balloon av. 34, ..	92.1	.12	64.?	60.1	52.9	31.0	24.0	20.0	18.0
7. Nearly dry air; hyg. 1°,..	91.0	.00	58.3	54.4	48.7	20.0	20.4	18.5	
7½. Partly dried; hyg. 12? ..	91.0	.03?	..	65.	53.9	..	25.7	20.0	
8. Hygrom. variable, av. 20..	93.2	.05	79.1	75.1	59.6	..	..	..	
9. Dry air; hyg. 2°, ..	92.0	.01	59.5	63.2	56.3	38.5	..	26.4	20.0

The last experiment is evidently affected with some accidental error, since the depression is *less* at 22.5 inches than at 30. I imagine the external air was admitted through an unobserved leakage of the tube, or a drop of water may have fallen in the tube, and thus moistened the air before it reached the wet-bulb.

I now detached the gasometer and balloon, and admitted the air of the room directly into the tube at stopcock *k* (fig. 8) keeping up a prolonged current at intervals of every two inches of pressure from 30.0 upwards to 5 inches, and then descending in the same manner: taking care to wet the thermometer from time to time as its water evaporated. In ascending the scale I regulated the pressures in the barometer-gage principally by manœuvring the stopcock (*k'*) next to the vacuum pipe, the orifice at *k* remaining constant: whereas in descending, I allowed *k'* to remain untouched while I brought the gage to the desired point by gradually opening the outer stopcock *k*.

The effect of this will be understood on viewing the apparatus: the current of air was considerably stronger in the last case than in the first, and in consequence the depressions are somewhat greater. To this it must be added, that in the ascending scale the depressions will tend to lag below their full amount, while in descending they will err in an opposite sense; all of which is well exhibited in dotted curves numbered 10, 11 of diagram 10. The mean of the two series (marked by a plain line on the diagram) may be assumed as a good foundation for the analysis we have proposed.

Experiments 10 *and* 11, *on depressions under diminished pressure.*

Temperature of the room 92°.2; dew-point 74°.8 = centesimal tension .58
Hair-hygrometer, 79 = ditto .57

Barom. pressure inches.	*Ascending series.* Temp of air.	Wet-bulb. 1	Wet-bulb. 2		*Descending series.* Wet bulb. 3	Wet-bulb. 4	Temp. of air.	Depression ascending.	Depression descending	Mean depression observed.	Calculated depression. $d \times \frac{30}{p}$
	°	°	°		°					°	
30	92.7	80.4	82.0	rewetted)	80.5		93.0	11.7	13.0	12.0	12.
28		79.7	80.8		79.2			12.6	14.3	13.1	12.9
26	92.9	78.0	80.0	rewetted	76.8	79.2		13.9	15.5	14.6	14.0
24			77.8		74.7	75.2		15.0	18.0	17.0	15.0
22	92.7		75.4	(rewetted	72.4	73.8		16.4	20.4	19.1	16.4
20			73.0			70.2		19.8	23.3	21.5	18.0
18			70.3			66.9		22.5	26.6	24.5	20.0
16			67.7			64.2		24.2	29.3	26.8	22.5
14	93.0		64.0			61.2		29.	32.3	30.6	35.7
12			60.0			57.4		33.	36.1	34.5	20.0
10			54.9	(rewetted	54.6	53.8	93.2	38.1	39.7	38.9	36.0
8			48.3		47.3		93.2	44.7	45.9	45.3	45.0
6			38.0		38.8		92.5	55.0	53.7	53.1	60.0
5			31.0		30.8		91.6	62.0	60.8	61.4	72.0
4.4				rewetted	23.7		89.8		66.1	66.1	81.8

At the first glance towards the final columns of this table, one might at first be led to exclaim, upon the wonderful accordance between theory and fact! The ascending series, especially, agrees exactly with the calculation in several points, and does not diverge materially until the pressure falls to six inches, far beyond the reach of any likely contingency within our observance.

But all this seemingly agreeable coincidence is, in a measure, delusory. The effect is compounded of two different influences—1, the rarefaction; and 2, the diminution of humidity which is consequent thereon. We know from our second section of experiments how to appreciate this latter disturbing cause, and so isolate the reduction of temperature due to the diminished pressure alone; but the prior experiments give us an opportunity of estimating it in a more direct manner. Thus, taking experiment 7, we have the following data: the temperature being 91°. Fahrenheit. The fourth column contains the hypothetical depressions on the supposition of the inverse-pressure ratio.

Barometrical pressure inches.	Depression in dry air. D	Increment observed. D—d	Theoretical depression. $d \times \frac{30}{p}$	Increment $d + \frac{30}{p} - d$	Calculated co-efficient.
	°	Δ		δ	Δ ÷ δ
30.0	32.7		32.7		
27.5	35.6	+ 2.9	43.6	+ 10.9	.27
15.0	42.3	+ 9.6	65.4	+ 32.7	.29
7.5	61.0	+ 28.3	130.8	+ 98.1	.29
6.0	70.8	+ 30.1	165.5	+ 132.8	.23
5.5	72.1	+ 39.4	176.5	+ 143.8	.27
5.4	72.8	+ 40.1	179.8	+ 147.1	.27

The rate of increment observed, it will be remarked, here invariably falls short of the calculated rate in the fifth column, but it bears always the same proportion to it, about one-third; as shewn in the sixth column: therefore in this example the law of the inverse pressures holds good relatively, but it requires a co-efficient to reduce the absolute amount. Thus, the maximum depression in dry air at any

pressure will, by the experiment, be equal to $d + .27\left(d\frac{30}{p} - d\right)$ instead of $d + \left(d\frac{30}{p} - d\right)$ (or simply $d\frac{0}{p}$). I will not seek to enquire the cause of this deviation from theory; or whether it be peculiar to the form of apparatus I employed; or whether the effect will be constant under all circumstances:—I will merely suggest that the supply of heat from extraneous sources—the brass tube (only half inch diam.) radiation, &c. could not fail to reduce the cooling effect of the mere current of air; and here we have the measure of their united disturbing power, which it is satisfactory to find constant throughout.

Let us now see whether the same constancy can be traced in the more elaborate experiment with common air (10-11.) The first thing necessary is to calculate the percentage of moisture for each step. Now, as under 30 inches the centesimal tension was found to be ·58 by the dew-point, and as no source of fresh supply was at hand, the tension at any other pressure should be directly as the pressure, or inversely as the volume; since it is evident that a double space, for instance, will require twice as much aqueous vapour to bring it to a given state of humidity; the aqueous tension, therefore, will be $\cdot 58 \times \frac{p}{30}$ for this series of experiments. Again, from our table of depressions, (from the diagram or from the formula) can be obtained, with the reading at these variable states of humidity, the depression either in dry air or in air of the initial tension ·58. I have, in fact, given both in the following table, and have set in the three last columns the calculated depressions by the expression just found of $d + .27\left(\frac{d\,30}{p} - d\right)$.

Tab. VIII.—*Experiment* 10-11, *reduced to a constant hygrometric state.*

Barometer. inches.	Centes. aqueous tension calc. $H \times \frac{p}{30}$	Tabular centesimal depression corresponding T	Observed depression variable aq. tens. d	Deduced depression for aq. ten. ·58 $d \times \frac{32}{T}$	Deduced depression for dry air, D = $d \times \frac{100}{T}$	Calculated depression for variable aq. tens. of second column.	Calculated depression for aq. tens. ·58	Calculated depression for dry air.
			°	°	°	°	°	°
30	.58	32	12.0	12.0	37.5	12.	12.0	37.5
28	.54	34	13.1	12.2	38.2	13.1	12.3	38.2
26	.50	37	14.6	12.5	39.0	14.5	12.6	39.1
24	.46	42	17.0	12.8	40.1	17.0	12.8	40.1
22	.42	44	19.1	13.8	43.3	18.2	13.3	41.4
20	.39	47	21.5	14.7	46.0	20.1	13.7	42.8
18	.35	50	24.5	15.7	49.0	22.3	14.3	44.6
16	.31	54	26.8	15.9	49.8	25.6	15.0	47.4
14	.27	58	30.6	16.9	52.7	28.8	15.9	49.7
12	.23	62	34.5	17.8	55.5	33.2	17.1	53.5
10	.19	66	38.9	18.6	58.2	39.2	18.7	58.9
8	.15	72	45.3	20.2	63.3	49.4	19.4	69.6
6	.11	76	53.1	22.3	69.8	63.0	25.7	80.4
5	.096	78	61.4	25.1	78.5	71.0	29.1	91.0
4.4	.085	79	66.1	26.7	83.5	78.0	34.8	99.6

With exception of the four lowermost entries, the three middle (or observed) columns of this table accord wonderfully well with the three last, which are calculated by the formula above given multiplied into T, (the tabular cent. dep.); which is variable in the first of them, (that of the experiments;) is equal to ·32 for the case of humidity ·58; and is of course = 0 for the final case, of extreme dryness. Were we to suppose that the dryness of the air did not mount higher than ·18 (second column) from some unperceived cause, the calculated depressions would suit equally well from beginning to end; and it must be remembered that any disturbing force will be much more felt in the low pressures. Moreover, it can hardly be expected that the depression should continue to follow the same law, after the evaporating surface has congealed into ice. Had the ascending series of depressions only been used, instead of the mean, the accordance would have been greater towards the middle of the scale.

It is hardly necessary to analyse any more of the present series, after ascertaining that the same co-efficient is equally applicable to dry and wet air. We may therefore proceed at once to the conclusion, that *the depression of the wet-bulb thermometer, ceteris paribus, varies inversely as the barometric pressure, the actual variation being for every case twenty-seven hundredths of the calculated variation.*

§ 4.—*Depressions under augmented barometric pressure.*

It would perhaps have been better to have preceded the last enunciation, by a description of the experiments included under this head, since they obviously form part of the same series, and must be governed by the same law. They need not detain us many minutes.

The modification of apparatus now employed is depicted in fig. 9. Between the gasometer and the brass tube furnished with the two thermometers was introduced a condensed air blow-pipe; while at the other extremity near the discharge cock *k'*, was adapted a syphon barometer capable of shewing an increase of pressure up to + 12 inches. By keeping up the action of the pump with the discharge cock more or less open, a current of condensed air could be maintained at any pressure until the readings of the wet-bulb became stationary; for, as before stated, it was upon the current only that reliance could be placed; and my endeavour was always to maintain the same rapidity in the passage of the air, although small variations in this particular do not, and ought not, to produce any sensible error.

Not having used a hygrometer in this series, I trust to the depression itself (at 30 inches) to supply the datum of the humidity; and here of course, under condensation, the moisture *increases* directly

with the pressure. On the diagram this is very conspicuous in figs. 13, 14; and as the air approaches dryness, the line formed will be seen amalgamating with the curvature of the former experiments.

TAB. IX.—*Depressions under increased pressure.*

Barom. pressure. inches.	First Experiment.			Second Experiment.			Third Experiment.			Fourth experiment.		
	Temp. air.	Depression.	Humidity.	Temp. air.	Depression.	Humidity.	Temp. air.	Depression.	Humidity.	Temp. air.	Depression.	Humidity.
	o	o		o	o		o	o				
30	93.5	23.5	.24	93.5	23.7	.24	85.0	24.0	.15	86.4	26.8	.10
33		—		93.6	20.9	.26		—			—	
36		21.5	.29	93.8	17.8	.29		14.0	.18		22.8	.12
42		19.5	.34	94.3	15.5	.34	85.2	11.4	.21		20.7	.14

In the last experiment the air was maintained for a long time at each pressure, whence its results are perhaps entitled to greater confidence than the rest. The direct theoretical depressions, $d \times \frac{30}{p}$ would be 26°.8, 22°.3, and 19°.1, which corrected by the co-efficient before found, would become 26°.8, 25°.6, and 24°.7; these again would have to be diminished for the altered humidity to 26.8, 24·5, and 22.8; still, however, differing materially from the experiment, which I attribute to the difficulty of keeping up a sufficient draft at the high pressures, in consequence of which the humidity is not fairly estimated.

If we examine the first experiment we shall have,

The direct geometrical depressions,.....	23.5	19.6	16.8
These modified by co-efficient, .27.....	23.5	22.4	21.7
Corrected to the incipient state of humidity will be,	23.5	20.0	18.1
The observed depressions being in this case,.....	23.5	21.5	19.5

nearly midway between the modified and the corrected numbers, and as much above the latter as they were below them in experiment 4,—so it will be not unreasonable to conclude that our formula would hold good for augmented depressions, if proper care were taken in conducting them.

We have now examined every case of depression that can be experienced in common air, and we may finally sum up this lengthy investigation by uniting the members of the formula, that it may comprehend both changes of humidity and changes of atmospheric pressure thus:—

$$d = 84f' - f'' + .27\left(\frac{d\,30}{p} - d\right).$$

The latter member of the equation may be converted into a table of multipliers for heights of the barometer other than 30, which will leave the table I have appended to the present paper applicable to all

circumstances that can occur. The rule for its use will be given in the proper place.

§ 5.—*Depression of wet-bulb in other gaseous media.*

It has been seen that the theory of the wet-bulb thermometer is entirely based on the relation of the specific heats, or capacities, of water, of vapour, and of air. It may be made therefore to furnish an unexceptionable and easy method of solving the much-contested question of the relative capacity of different gaseous fluids, by substituting any of the latter for common air in the experimental determination of the depression.

By GAY LUSSAC's formula we perceive that the depression varies precisely in the inverse ratio of the air's capacity, c (see p. 405.) APJOHN's formula is based on the same datum; thus the specific heat of vapour at 50° being 1129 (= 967 + 212 — 50); that of water being 1; and that of air $c = 0.267$; "one part of air in cooling through d degrees will raise the temperature of 0.267 part water through the same number, and will consequently be adequate to vaporize a quantity of water represented by $\frac{\cdot 267\ d.}{1129}$." Now, as $\cdot 267\ d\ (= c\ d)$ is a constant quantity, any change in the value of c must affect d in an opposite or inverse sense, that is $c' = \frac{c\ d}{d'}$, d' being the depression observed in other medium than common air.

As most likely to exhibit any difference of specific heat, and without reference to any prior determination of the question, I selected two gases, *hydrogen* and *carbonic acid*, as far at variance in essential points as could be wished, and proceeded with them exactly as had been done with ordinary air. On account of the mode of preparing the two gases by distillation through a water-trough, they entered the gasometer surcharged with moisture: and, as noticed below, even after being well dried by the acid in the chamber, they took up moisture from the discharge-pipe on their passage to the wet-bulb. I could only approximatively remedy this evil by immediately filling in common air, and finding how much moisture the latter also absorbed in its passage. The error was of course less, if at all, perceptible at the high temperatures, and in a fresh series of experiments it was obviated by the introduction of my tell-tale hair hygrometer.

Wishing to save the gas, it was made to pass into another gasometer instead of into the open air; on which account the current both of hydrogen and of carbonic acid passed more slowly through the steam-heated tube than the air had done, and their temperature only rose to 160 and 170, in lieu of 180 and even 190 as at first. Here follow

the readings which were considered as coincident, but, as before, there was difficulty in keeping the dry thermometer stationary,

TAB. X.—*Depressions with Hydrogen gas. First Series.*

	Therm. in air.	Wet-bulb.	Depression.	Hygrometer.	Tension centesimal.	Tabular depression in dry air.	Ratio. $d \div D$
	°	°	°				
1. Through steam pipe,	92.0	67.8	24.2	—	?	37.1	
2. Ditto, steam on, ..	160.0	83.2	76.8	—	nearly dry.	81.5	.94
3. Ditto, ditto, ...	137.0	76.4	60.6	—	ditto.	65.3	.93
4. Ditto, cold, ...	93.8	67.5	26.3	44 ?	.17 ?	38.1	

The hydrogen of the gasometer in the first two experiments was supposed to be dry, but it was found that it acquired moisture in passing through the pipes, which had been moistened by the distillation of the hydrogen; the amount of error was estimated by filling common air in, and finding how much its depression differed from the full rate. The gas of 3, and 4 was passed out into a vessel containing the hair hygrometer; but still no great confidence was placed in the series, and on two subsequent days fresh gas was prepared.

Second Series.

5. Protracted current of hydrogen gas,..	85.4	60.0	25.4	
6. Common air treated exactly in the same manner, ...	90.6	59.0	31.6	= 29.1 at 85·4
Ratio of	29°.1	to 25°.4	as	1.00 to .87

This was still unsatisfactory, as there was no mode of testing the hygrometric state of the gas: I now therefore fitted the glass chamber enclosing the hair hygrometer, (as in fig. 1) and took the following readings after intervals of a day each.

	t	t'	d	h	Calc. Maxim. Depress. in Hydrogen.	Depress. in Atm. air.	Ratio. $d \div D$
7. Hydrogen, current,	87.8	60.5	27.3	8	29.5	34.8	.84
8. Ditto, full draft, ..	88.0	59.7	28.3	5	29.8	34.9	.86
9. Ditto, ditto, ...	84.0	57.1	26.9	4	28.0	32.8	.85
10. Ditto, ditto, ...	88.5	58.5	30.0	4	31.2	35.2	.88
11. Common air.	87.0	54.8	32.2	4 ?	33.5	34.4	
12. Ditto, ...	83.1	52.1	32.0	2	32.6	32.4	

Still a fourth series was thought necessary; and in this all access of moisture to the tubes being prevented by passing the gas over sulphuric acid before it entered the gasometer, and leaving it for a week to dry thoroughly, the hair hygrometer marked extreme siccity: precaution was also taken to cool the wet-bulb with ice below the depression point, before inserting it in the tube.

Fourth Series, Hydrogen gas.

	t	t'	d	h.	D	$d \div D$
13. Full draft,....	86.7	58.5	28.2	0	34.2	.82
14. Ditto, ...	85.0	57.4	27.6	0	33.4	.83
15. Ditto, ...	82.8	56.5	26.3	0	32.2	.81

This fourth series, on which every care was bestowed to ensure accuracy, confirming as it does the ratio of the prior experiments, certainly tends to prove that hydrogen produces a less depression than common air in the proportion of 82 to 100 ; and consequently that the specific heat of this gas for equal volumes should be 1.22, that of atmospheric air being 1.

TAB. XI.—*Depressions with Carbonic Acid.*

	Temp. air. t	Wet-bulb. t'	Depression. d	Hair hygr.	Tabular depression for dry air.	Ratio. $\frac{d}{D}$
1. Current through	°	°	°		D	
steam pipe, ..	91.7	66.2	25.5	(acquired moisture .20 ?)	36.3	?
2. Do. steam on,	161.0	85.0	76.0	Nearly dry ?	82.2	.94
3. Do. quicker draft,	160.0	81.5	78.5	ditto,	81.5	
4. Common air, ..	86.8	60.8	26.0		34.3	

The experiment with common air shews that the passages still imparted moisture to the amount of full ·12, and therefore vitiated the result as with hydrogen. The trial was renewed with the precaution of employing the hair hygrometer.

				h		d	D	$d \div$ D
5. Short glass tube,	83.6	55.0	28.6	5	Corrected	30.1	32.6	.92
6. Ditto, ...	86.2	55.2	31.0	3	for dry	32.0	34.0	.94
7. Ditto, ...	83.7	53.6	30.0	3	air or	31.0	32.6	.95
8. Common air, ...	88.2	54.5	33.7	3	max. dep.	34.8	35.0	

Here again the depression in carbonic acid gas is proved to be 94 hundredths of that in common air, whence the specific heat of this gas should turn out 1.06, air being 1.00. A third series was taken :

8. Well dried, ..	88.7	56.2	32.5	0	32.5	35.3	91
9. Ditto, ...	84.8	55.1	29.7	0.5	29.9	33.2	90
10. Ditto, ...	89.6	57.2	32.4	1	32.8	35.8	90

In the last three experiments which were made with the precautions I have described, in the hydrogen experiments, (13-15) a little of the latter gas was mixed ($\frac{1}{20}$th) with the carbonic acid ; while in experiments 6, 7, common air may have been present to the same extent. We may therefore assume the maximum depression in dry carbonic acid to be about 92 per cent. of that in atmospheric air; and its spec. heat = 1·087.

Although these unexpected results are supported by their great uniformity, I still feel hesitation in inviting for them the implicit confidence of chemists, in opposition to the very opposite conclusions of other experimenters. Had the specific heat of one gas proved in *defect* and the other in *excess*, it would have been more consonant with the analogy of their specific gravity,—but that two gases so strongly contrasted, should both err, on the same side, I own to be plausible evidence against me. Still I hardly think that the 8 per cent. discrepancy in the carbonic acid experiments is within the limits of experimental error ; and the 18 per cent. of the hydrogen is certainly more than I am willing to allow to be attributable to such a cause.

At any rate it must be conceded that the method itself possesses superior facility to the process of De la Roche and Berard*, also followed by Haycraft†, or to that more recently followed by my friends Messrs. F. Marcet and De la Rive of Geneva‡.

It may be as well to recite the conflicting values arrived at by these and other authors, including M. Dulong§, whose mode of investigation by the velocity of sonorous vibrations in the respective gases, was most ingenious in itself, and perhaps better entitled to respect than any other.

Tab. XII.— *Specific heat of gaseous bodies by volume, under constant pressure.*

	By De la Roche and Berard.	By Haycraft	By Marcet and De la Rive.	By DuLong	By wet-bulb depression.
Atmospheric air,	1,000	1,000	1,000	1,000	1,000
Oxygen.	976	1,000	1,000	1,000	—
Hydrogen, ...	903	1,000	1,000	1,000	1,220
Nitrogen,.....	1,000	1,000	1,000	1,000	—
Carbonic Acid, .	1,258	1,000	1,000	1,175	1,087
Carburett. Hyd.	1,553	1,060	1,000	1,531	—
Carbonic oxide,	1,034	—	1,000	1,000	—
Nitrous gas, ..	1,350	—	1,000	1,160	—

Notwithstanding the tendency of my own experiments, every one must feel a prejudice on a view of this table in favor of the conclusions of the English and the Genevese philosophers ; namely, that all the gases have the same specific heat.

In such case however it will be necessary to assign some other cause for the indubitable results above given, or our judgment must be suspended, until a careful repetition of similar experiments may determine the conditions with other gases, and lead to some definite conclusions for the whole of this most interesting question.

§ 5.—*A few illustrations of the wet-bulb theory.*

My paper has expanded to such a formidable length, that I am loath to burthen it with many " last words :" yet I cannot refrain from pointing out an instance or two of practical application, and shewing that d and f' are as important elements in the play of meteorological phenomena as the dew-point itself, and require equally to be studied by naturalists.

1. The Baron Hugel remarked, that ice was formed in Cashmír with the thermometer at 44°‖ at an elevation of 15,000 feet : whence he concluded that the freezing point rose as the boiling point fell. This startling paradox is now readily explained : the air of the plains is dry enough at all times in those latitudes :—it becomes relatively drier in expanding on the mountains, while the depression simultaneously

* Annales de Chimie, lxxxv. 126.
† Annales de Chimie, xxvi. 298.
‡ Ditto 1829, xxxv. 5.
§ Ditto, xli. 113.
‖ See J. A. S. vol. v. p. 186.

increases. When $t = 44°$, D = 15.5 which + .27$\left(\frac{d\ 30}{16.8} - d\right)$ for 15,000 feet, = 18.5, so that if the air were already charged with a third of its saturating quantity of vapour, the depression of 13 degrees would still cool a surface of water below the freezing point.

GAY LUSSAC points out a similar fact noted on SAUSSURE's ascent of Mont Blanc. " En faisant tourner sur le *Col du géant* un thermomètre dont la boule était enveloppée d' une éponge, il a obtenu un refroidissement de 9°.3 C (16°.7 Farh.) au dessous de la température de l'air qui était de 10°.1 (50°. 2 F.) ainsi l' evaporation peut concourir avec le rayonnement pour déterminer la congélation de l'eau à la surface de la terre, dans un air dont la température serait de plusieurs degrés au-dessus de zéro*."

2. The formation of hail is readily explained on the same principle. The drops of water passing through a stratum of very attenuated dry air, perhaps even warmer than the saturated cloud they have quitted, are cooled to congelation—nay, most likely much below it, since they are not remelted in their onward progress to the earth, but are apparently enlarged by deposition of fresh moisture. Hail is seldom observed to fall in damp weather.

Thus also, frozen clouds (cirri) may be found at elevations in the air much lower than would belong by theory to a temperature of 32°, and their dissipation while still in a frozen state, is also accounted for.

3. The increase of rain drops as they approach the earth has been satisfactorily proved to originate in the deposit of atmospheric moisture on their surface, cooled below the dew-point temperature.

4. Why is not the air at sea always surcharged with moisture ?

The actual tension of vapour in the air does not depend on t but t': now the bulk of the ocean maintains an uniform temperature, in general a few degrees below that of the air in the day time: f' therefore being then always less than f, saturation cannot take place, however much water may be present. But there is another reason; salt-water has a lower tension than pure water; that is, were it heated to t, its tension would not be f. It boils at $213\frac{1}{20}$ (?) in lieu of 212°, which reduces its tension about one part in 40—and the same proportion will hold good, on DALTON's hypothesis, for lower temperatures. In clear nights the air on ship board must always be fully charged with moisture, and hence the heavy dew on deck.

5. An analogous explanation can be given of the curious fact observed by M. CLEMENT in 1821†, that if a thermometer bulb coated with lint be dipped in a saturated solution of any salt (or the salt in powder) and be held in aqueous vapour of 212°, it will acquire itself

* Annales de Chimie, xxi. 92. † URE's Chemical Dictionary, p. 284.

a *higher* temperature, equal to what would be the boiling point of a similar solution. Here the saline solution at 212° cannot support a tension of f' (= 30 in.) ; deposition therefore takes place with consequent disengagement of latent heat, until the tension of the salt at $t + x$ finds itself in equilibrio, or = 30 inches*.

6. Perkins has observed, that when water is thrown upon a heated metal not visibly red, it *flashes* into steam suddenly : but when placed upon iron, silver or gold at a much higher heat, it takes a considerable time to evaporate. Here would seem to be an indication that at or about 1200 Farh. the evaporation point gradually rises to exactly 212°, and that beyond this it becomes negative, or, the depression becomes so great that it falls below the boiling point†.

This is surely a more rational explanation than Perkins's, who supposed the liquid to be prevented from evaporating from the enormous pressure on its surface :—how could such a false equilibrium hold with free space around for the vapour to expand into ?

Many other illustrations might be brought forward, but I forbear from exhausting the patience of my readers, and will here conclude with the tables for the depression of the wet-bulb at temperatures from 30° to 180° under the constant pressure of 30 inches. For other states of the barometer the small table below will be found sufficient, until my friends in Nepál, Dehra Dun, or the Nilgíris may furnish better data for its correction.

Table of Multipliers, *to convert the following Tabular Depressions at* 30 *inches* (1·000) *into the depressions at any other pressure of the atmosphere.*

Barometer inches.	Density of the air. e.	Multiplier $1+.27\overline{e-1}$	Barometer inches.	Density of the air. e.	Multiplier $1+.27\overline{e-1}$	Barometer inches.	Density of the air. e.	Multiplier $1+.27\overline{e-1}$
29·5	1·016	1·004	24·5	1·224	1·060	19·5	1·538	1·145
29·0	1·034	1·009	24·0	1·250	1·067	19·0	1·579	1·156
28·5	1·053	1·014	23·5	1·277	1·075	18·5	1·621	1·168
28·0	1·071	1·019	23·0	1·304	1·082	18·0	1·666	1·180
27·5	1·091	1·025	22·5	1·333	1·090	17·5	1·720	1·194
27·0	1·111	1·030	22·0	1·364	1·098	17·0	1·765	1·206
26·5	1·132	1·036	21·5	1·395	1·107	16·5	1·818	1·221
26·0	1·154	1·042	21·0	1·428	1·115	16·0	1·875	1·236
25·5	1·176	1·048	20·5	1·463	1·125	15·5	1·935	1·252
25·0	1·200	1·054	20·0	1·500	1·135	15·0	2·000	1·270

Note.—When the depression in attenuated air has been observed, *divide* it by the multipliers here given, before entering the table following to find the aqueous tension.

* A new source of error in the wet-bulb is hence suggested, in the substance with which the bulb is coated :—flannel, linen, and cotton may have different hygrometric affections. This is a fit subject for inquiry.

† The very slight modification required in the theoretical curve of depressions, to produce the effect alluded to in the text, is shewn by a dotted line in Fig. 5 of Pl. XXI. Apjohn's temperature of evaporation only reaches 212° at 2800°. Leslie's at 2600° ; beyond which it would continue to rise.

TABLE *of the* DEPRESSIONS *of the Wet-bulb Thermometer, for degrees of temperature, and every twentieth part of hygrometric saturation.*

Temperature.	The centesimal tension of vapour, or percentage of humidity being																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
30	10·6	9·2	8·3	7·6	6·9	6·4	5·8	5·3	4·8	4·4	4·0	3·5	3·1	2·6	2·3	1·9	1·6	1·1	0·7	0·3
31	10·9	9·4	8·5	7·8	7·1	6·5	6·0	5·4	5·0	4·5	4·1	3·6	3·2	2·8	2·3	1·9	1·6	1·1	0·7	0·4
32	11·2	9·7	8·8	8·0	7·3	6·7	6·2	5·6	5·1	4·6	4·2	3·7	3·3	2·8	2·4	2·0	1·6	1·1	0·8	0·4
33	11·5	10·0	9·8	8·2	7·5	6·9	6·3	5·7	5·3	4·8	4·3	3·8	3·4	2·9	2·5	2·0	1·7	1·1	0·8	0·4
34	11·8	10·2	9·2	8·4	7·7	7·1	6·5	5·9	5·4	4·9	4·4	3·9	3·5	3·0	2·5	2·1	1·7	1·2	0·8	0·4
35	12·1	10·5	9·5	8·7	7·9	7·3	6·6	6·0	5·5	5·0	4·5	4·0	3·5	3·1	2·6	2·1	1·8	1·2	0·8	0·4
36	12·4	10·8	9·7	8·9	8·1	7·4	6·8	6·2	5·7	5·1	4·6	4·1	3·6	3·2	2·7	2·2	1·8	1·2	0·8	0·4
37	12·7	11·0	9·9	9·1	8·3	7·6	7·0	6·3	5·8	5·3	4·7	4·2	3·7	3·2	2·7	2·2	1·9	1·3	0·9	0·4
38	13·0	11·3	10·2	9·3	8·5	7·8	7·1	6·5	5·9	5·4	4·9	4·3	3·8	3·3	2·8	2·3	1·9	1·3	0·9	0·4
39	13·3	11·5	10·4	9·5	8·7	8·0	7·3	6·6	6·1	5·5	5·0	4·4	3·9	3·4	2·9	2·3	1·9	1·3	0·9	0·4
40	13·6	11·8	10·6	9·7	8·9	8·1	7·5	6·8	6·2	5·6	5·1	4·5	4·0	3·5	2·9	2·4	2·0	1·4	0·9	0·4
41	13·9	12·0	10·9	9·9	9·1	8·3	7·6	7·0	6·4	5·8	5·2	4·6	4·1	3·5	3·0	2·5	2·0	1·4	0·9	0·4
42	14·2	12·3	11·1	10·2	9·3	8·5	7·8	7·1	6·5	5·9	5·3	4·7	4·2	3·6	3·1	2·5	2·1	1·4	1·0	0·5
43	14·6	12·6	11·4	10·4	9·6	8·8	8·0	7·3	6·7	6·0	5·4	4·8	4·3	3·7	3·1	2·6	2·1	1·5	1·0	0·5
44	14·9	12·9	11·6	10·7	9·8	8·9	8·2	7·5	6·8	6·2	5·6	5·0	4·4	3·8	3·2	2·6	2·2	1·5	1·0	0·5
45	15·3	13·3	11·9	10·9	10·0	9·2	8·4	7·7	7·0	6·3	5·7	5·1	4·5	3·9	3·3	2·7	2·2	1·5	1·0	0·5
46	15·6	13·5	12·2	11·2	10·2	9·4	8·6	7·8	7·1	9·5	5·8	5·2	4·6	4·0	3·4	2·8	2·3	1·6	1·1	0·5
47	16·0	13·9	12·5	11·4	10·5	9·6	8·8	8·0	7·3	6·6	6·0	5·3	4·7	4·1	3·4	2·8	2·3	1·6	1·1	0·5
48	16·3	14·1	12·7	11·7	10·7	9·8	9·0	8·2	7·5	6·8	6·1	5·4	4·8	4·1	3·5	2·9	2·4	1·6	1·1	0·5
49	16·7	14·5	13·0	11·9	10·9	10·0	9·2	8·4	7·6	6·9	6·2	5·6	4·9	4·2	3·6	2·9	2·4	1·7	1·1	0·5
50	17·1	14·8	13·3	12·2	11·2	10·3	9·4	8·6	7·8	7·1	6·4	5·7	5·0	4·4	3·7	3·0	2·5	1·8	1·2	0·6
51	17·5	15·2	13·7	12·5	11·5	10·5	9·6	8·8	8·0	7·3	6·5	5·8	5·1	4·5	3·8	3·1	2·5	1·8	1·2	0·6
52	17·9	15·5	14·0	12·8	11·7	10·7	9·8	9·0	8·2	7·4	6·7	6·0	5·3	4·6	3·9	3·2	2·6	1·8	1·2	0·6
53	18·3	15·9	14·3	13·1	12·0	11·0	10·1	9·2	8·4	7·6	6·8	6·1	5·4	4·7	3·9	3·2	2·6	1·9	1·2	0·6
54	18.7	16·2	14·6	13·4	12·3	11·2	10·3	9·4	8·6	7·8	7·0	6·3	5·5	4·8	4·0	3·3	2·7	1·9	1·3	0,6
55	19·1	16·5	14·9	13·7	12·5	11·5	10·5	9·6	8·7	7·9	7·1	6·4	5·6	4·9	4·1	3·4	2·7	1·9	1·3	0,6
56	19·6	17·0	15·3	14·0	12·8	11·8	10·8	9·8	9·0	8·1	7·3	6·5	5·8	5·0	4·2	3·5	2·8	2·0	1·3	0,6
57	20·0	17·3	15·6	14·3	13·1	12·0	11·0	10·0	9·2	8·3	7·5	6·6	5·9	5·1	4·3	3·5	2·9	2·0	1·4	0,7
58	20·4	17·7	15·9	14·6	13·4	12·2	11·2	10.2	9·3	8·5	7·6	6·8	6·0	5·2	4·4	3·6	2·9	2·1	1·4	0,7
59	20·8	18·0	16.2	14·9	13·6	12·5	11·4	10·4	9·5	8·6	7·8	6·9	6·1	5·3	4·5	3·7	3·0	2·1	1·4	0,7
60	21·3	18·5	16.6	15·2	14·0	12·8	11·7	10·7	9·7	8·8	8·0	7·1	6·3	5·4	4·6	3·8	3·1	2·2	1·4	0,7

TABLE *of the* DEPRESSIONS *of a Wet-bulb Thermometer, for degrees of temperature, and every twentieth part of hygrometric saturation.*

Temperature.	The centesimal tension of vapour, or percentage of humidity being																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	21·7	18·8	16·9	15·5	14·2	13·0	11·9	10·9	9·9	9·0	8·1	7·2	6·4	5·5	4·7	3 8	3·1	2·2	1·5	0·7
62	22·2	19·2	17·3	15·9	14·6	13·3	12·2	11·1	10·2	9·2	8·3	7·4	6·5	5·7	4·8	3·9	3·2	2·3	1·5	0·7
63	22·6	19·6	17·6	16·2	14·8	13·6	12·4	11·3	10·3	9·4	8·4	7·5	6·6	5·8	4·8	4·0	3·2	2·3	1·5	0·7
64	23·1	20·0	18·0	16·5	15·1	13·9	12·7	11·6	10·6	9·6	8·6	7·7	6·8	5·9	4·9	4·1	3·3	2·4	1·6	0·8
65	23·5	20·4	18·4	16·8	15·4	14·1	12·9	11·8	10·8	9·7	8·8	7·8	6·9	6·0	5·0	4·1	3·4	2·4	1·6	0·8
66	24·0	20·8	18·7	17·2	15·7	14·4	13·2	12·0	11·0	10·0	9·0	8·0	7·0	6·1	5·1	4·2	3·4	2·4	1·6	0·8
67	24·4	21·1	19·1	17·5	16·0	14·6	13·4	12·2	11·2	10·1	9·1	8·1	7·2	6·2	5·2	4·3	3·5	2·5	1·7	0·8
68	24·9	21·6	19·4	17·8	16·3	14·9	13·7	12·5	11·4	10·3	9·3	8·3	7·3	6·3	5·3	4·4	3·6	2·5	1·7	0·8
69	25·4	22·0	19·8	18·1	16·7	15·2	14·0	12·7	11·6	10·5	9·5	8·4	7·5	6·5	5·4	4·5	3·6	2·6	1·7	0·8
70	25·9	22·4	20·2	18·5	17·0	15·3	14·2	13·0	11·9	10·7	9·7	8·6	7·6	6·6	5·5	4·6	3·7	2·6	1·8	0·8
71	26·4	22·9	20·6	18·8	17·3	15·6	14·5	13·2	12·1	10·9	9·9	8·8	7·8	6·7	5·7	4·7	3·8	2·7	1·8	0·9
72	26·8	23·2	20·9	19·1	17·6	15·9	14·7	13·4	12·3	11·1	10·0	8·9	7·9	6·8	5·7	4·7	3·8	2·7	1·8	0·9
73	27·3	23·7	21·3	19·5	17·9	16·2	15·0	13·7	12·5	11·3	10·2	9·1	8·0	7·0	5·8	4·8	3·9	2·8	1·9	0·9
74	27·8	24·1	21·7	19·8	18·2	16·5	15·3	13·9	12·7	11·5	10·4	9·3	8·2	7·1	6·0	4·9	4·0	2·8	1·9	0·9
75	28·3	24·5	22·1	20·2	18·6	16·8	15·6	14·2	13·0	11·7	10·6	9·4	8·3	7·2	6·1	5·0	4·0	2·9	1·9	0·9
76	28·8	25·0	22·4	20·5	18·9	17·1	15·8	14·4	13·2	11·9	10·8	9·6	8·5	7·3	6·2	5·1	4·1	2·9	2·0	0·9
77	29·3	25·4	22·8	20·9	19·2	17·4	16·1	14·7	13·4	12·1	10·9	9·7	8·6	7·5	6·3	5·2	4·2	3·0	2·0	1·0
78	29·8	25·8	23·2	21·3	19·5	17·7	16·4	14·9	13·6	12·4	11·1	9·9	8·8	7·6	6·4	5·3	4·2	3·0	2·0	1·0
79	30·3	26·3	23·6	21·6	19·9	18·0	16·7	15·2	13·9	12·6	11·3	10·1	8·9	7·7	6·5	5·4	4·3	3·1	2·1	1·0
80	30·8	26·7	24·0	22·0	20·2	18·3	16·9	15·5	14·1	12·8	11·5	10·3	9·0	7·8	6·6	5·4	4·4	3·1	2·1	1·0
81	31·3	27·1	24·4	22·3	20·5	18·6	17·2	15·7	14·3	13·0	11·7	10·4	9·2	8·0	6·7	5·5	4·5	3·2	2·1	1·0
82	31·8	27·6	24·7	22·7	20·9	18·9	17·5	16·0	14.6	13·2	11·9	10·6	9·3	8·1	6·8	5·6	4·5	3·2	2·2	1·0
83	32·3	28·0	25·1	23·0	21·2	19·2	17·8	16·2	14·8	13·4	12·1	10·8	9·5	8·2	6·9	5·7	4·6	3·3	2·2	1·1
84	32·8	28·4	25·5	23·4	21·5	19·5	18·0	16·5	15·0	13·6	12·3	10·9	9·6	8·4	7·0	5.8	4·7	3·3	2·2	1·1
85	33·3	28·9	25·9	23·8	21·8	19·8	18·3	16·7	15·2	13·8	12·5	11·1	9·8	8·5	7·1	5·9	4·7	3·4	2·3	1·1
86	33·9	29·4	26·4	24·2	22·2	20·7	18·6	17·0	15·5	14·1	12·8	11·3	10·0	8·6	7·3	6·0	4·8	3·5	2·3	1·1
87	34·4	29·8	26·8	24·5	22·6	21·0	18·9	17·3	15·7	14.3	13·0	11·5	10·1	8·8	7·4	6·1	4·9	3·5	2·3	1·1
88	34·9	30·2	27·1	24·9	22·9	21·3	19·2	17·5	16·0	14·5	13·1	11·6	10·3	8·9	7·5	6·2	5·0	3·6	2·4	1·1
89	35·4	30·7	27·6	25·3	23·2	21·6	19·5	17·8	16·2	14·7	13·3	11·8	10·4	9·0	7·6	6·3	5·0	3·6	2·4	1·2
90	36·0	31·2	28·0	25·7	23·6	22·0	19·8	18·1	16·5	14·9	13·6	12·0	10·6	9·2	7·7	6·4	5·1	3·7	2·4	1·2
91	36·5	31·6	28·4	26·1	23·9	22·3	20·1	18·3	16·7	15·1	13·7	12·2	10·7	9·3	7·8	6·5	5·2	3·7	2·5	1·2

TABLE *of the* DEPRESSIONS *of a Wet-bulb Thermometer, for degrees of temperature, and every twentieth part of hygrometric saturation.*

Temperature.	The centesimal tension of vapour, or percentage of humidity being																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
92	37·1	32·1	28·9	26·5	24·3	22·7	20·4	18·6	17·0	15·4	14·0	12·3	10·8	9·5	8·0	6·6	5·3	3·8	2·5	1·2
93	37·6	32·5	29·3	26·8	24·7	23·0	20·7	18·9	17·2	15·6	14·2	12·5	10·9	9·6	8·1	6·6	5·3	3·8	2·6	1·2
94	38·2	33·0	29·8	27·3	25·0	23·3	21·0	19·2	17·5	15·8	14·4	12·7	11·1	9·7	8·2	6·8	5·4	3·9	2·6	1·3
95	38·7	33·5	30·2	27·6	25·4	23·6	21·3	19·4	17·7	16·1	14·6	12·9	11·3	9·9	8·3	6·8	5·5	4·0	2·6	1·3
96	39·3	34·1	30·8	28·1	25·8	23·6	21·6	19·7	15·1	16·3	14·7	13·1	11·5	10·0	8·7	6·9	5·5	4·0	2·7	1·3
97	39·8	34·5	31·2	23·5	26·1	23·9	21·9	20·0	15·3	16·5	14·9	13·3	11·7	10·1	8·8	7·0	5·6	4·1	2·7	1·3
98	40·4	35·0	31·6	28·9	26·5	24·2	22·2	20·3	05·6	16·8	15·1	13·5	11·9	10·3	8.9	7·1	5·6	4·7	2·7	1·3
99	41·0	35·5	32·1	29·3	26·9	24 6	22·5	20·6	15·9	17·0	15·3	13.7	12·0	10·4	9·0	7·2	5·7	4·8	2·8	1·3
100	41·6	36·1	32·6	39·8	27·3	25·0	22·9	20·6	16·2	17·3	15·5	13.9	12·2	10·6	9·2	7·4	5·8	4·8	2·8	1·4
101	42·2	36·6	33·0	40·2	27·7	25·3	23·2	20·9	16·4	17·5	15·8	14.1	12·4	10·8	9·3	7·5	5·9	4·9	2·9	1·4
102	42·8	37·1	33·5	40·6	28·1	25·7	23·5	21·5	16·7	17·8	16·0	14.3	12·6	10·9	9·4	7·6	6·0	5·0	2·9	1·4
103	43·4	37·6	34·0	41·1	28·5	26·0	23·9	21·8	17·0	18·0	16·2	14.5	12·7	11·1	9·6	7·7	6·1	5·0	2·9	1·4
104	44·0	38·1	34·4	41·5	28·9	26·4	24·2	22·1	17·3	18·3	16·4	14.7	12·9	11·2	9·7	7·8	6·2	5·1	3·0	1·4
105	44·6	38·7	35·0	41·9	29·2	26·8	24·5	22·4	17·5	18·5	16·7	14.9	13·0	11·4	9·8	7·9	6·2	5·1	3·0	1·5
106	45·2	39·2	35·4	42·4	29·6	27·1	24·9	22·7	17·8	18·8	16·9	15.1	13·2	11·5	10·0	8·0	6·3	5·2	3·1	1·5
107	45·8	39·7	35·9	42·8	30·0	27·5	25·2	23·0	18·1	19·0	17·1	15.3	13·4	11·7	10·1	8·1	6·4	5·3	3·1	1·5
108	46·4	40·2	36·3	43·2	30·4	27·8	25·5	23·3	18·4	19·3	17·3	15.5	13·5	11·8	10·2	8·2	6·5	5·3	3·1	1·5
109	47·0	40·7	36·8	43·6	30·8	28·2	25·8	23·6	18·6	19·5	17·6	15.7	13·7	12·0	10·3	8·3	6·6	5·4	3·2	1·5
110	47·6	41·3	37·3	44·1	31·2	28·6	26·2	23 9	18·9	19·8	17·8	15.9	13·9	12·1	10·5	8·4	6·7	5·4	3·2	1·6
120	53·9	46·7	42·2	48·6	35·3	32·3	29·6	27·0	21·8	22·4	20·1	18.0	15·7	13·7	11·8	9·5	7·5	6·1	3·7	1·8
130	60·5	52·4	47·4	53·3	39·7	36·3	33·3	30·4	24·8	25·1	22·6	20.2	17·7	15·4	13·3	10·7	8·5	6·8	4·1	2·0
140	67·3	58·3	52·7	58·2	44·1	40·4	37·0	33·8	27·9	27·9	25·2	22.5	19·7	17·2	14·7	11·9	9·4	7·5	4·6	2·2
150	74·3	64·4	58·2	63·2	48·7	44·6	40·1	37·3	31·1	30·8	27·8	24.8	21·7	18·9	16·2	13·1	10·4	8·2	5·0	2·4
160	81·5	70 7	63·8	68·3	53·5	48·9	44·8	40·9	34·4	33·8	30·5	27.2	23·9	20·8	17·8	14·4	11·4	8·9	5·5	2·7
170	88·9	77·1	69·6	73·6	58·3	53·3	52·9	44·6	37·8	36·9	33·2	29·7	26·0	22·7	19·4	15·7	12·4	9·7	6·0	2·9
180	96·5	83·7	75·5	79·1	63·3	57·9	57·1	48·4	41·3	40·1	36·1	32·2	28·3	24·6	21·0	17·1	13·5	10·5	6·6	3·2
184	100·0	86·7	78·3	71·6	65·6	60·	55·	50·2	45·8	41·5	37·4	33·4	29·4	25·5	21·6	17·7	14·	10·3	6·8	3·3

To find the real quantity of moisture in the air, the *centesimal tension* deduced from this table must be multiplied into the aqueous tension for the given temperature, extracted from DALTON's, BIOT's, or URE's tables.

VI.—*Proceedings of the Asiatic Society.*

Wednesday Evening, 3rd August, 1836.

The Honorable Sir Edward Ryan, President, in the chair.

Mr. W. Spiers, proposed at the last meeting, was ballotted for, and duly elected a Member of the Society.

Mr. Conductor Dawe, of the Delhi Canal Establishment, proposed at the last meeting, was, upon the favorable report of the Committee of Papers, elected an associate member.

Mekhara Meng, uncle of the present King of Ava, acknowledged his election as an honorary member in a Bengálí letter, of which the following is a literal translation :—

Mekhara Ra'ja *to the learned Members of the Asiatic Society of Calcutta, commands.*

I am informed of the contents of the letter from this learned body, and of the honor they have done to me. But so difficult is the attainment of knowledge, that I can by no means hold myself worthy of such a distinction. The progress of knowledge may be likened to the ascent of a lofty mountain,—he that attains the summit will gain the first glimpse of the rising sun, then he in the centre, while yet it is hidden from the crowd at the base. The sun is to them a thing entirely imperceptible. Afterwards, when the solar orb declines, it still remains visible and palpable to him who has surmounted the hill, while the others have a partial and fading remembrance of its glory. Thus are there gradations in the acquirement and appreciation of learning, and there is no limit to its increase, nor can any thing compare with its excellence.

The enjoyments of worldly life are finite, and afford little variety—riches bring satiety ; but there is no satiety in knowledge. Every day brings novel food to the mind, and only whets the appetite for more. I do not then think myself learned, but it is a law of nature that the bulk of each species should remain on an equality, whether man, beast, reptile, tree, or land itself—and hold social commune with its fellows.

My name has been inserted in the list of the learned men—I am glad to hear it, for the mind that cannot traverse alone the field of knowledge ; in company of judicious guides, may derive instruction and advantage at every step. I shall know what I have not known—hear what I have not heard. All my doubts may be explained, my conjectures certified :—therefore am I filled with joy, for I would have my ignorance enlightened.

Should the Society wish to know any thing relative to the Burmese literature of my country, I will do my utmost to supply every information.

As the learned members are acquainted with various languages, I have caused this letter to be written in the Pálí language* and in the Bengálí character.

The Secretary read the following reply from Government to the application made, in conformity with the resolution of the last meeting, on the subject of the publication of the Cochin Chinese Dictionary.

To James Prinsep, Esq.

Genl. Dept. *Secretary to the Asiatic Society.*

Sir,

I am directed to acknowledge the receipt of your letter, dated the 11th instant, and in reply to state that the Right Honorable the Governor General of India in Council will be prepared to sanction an expense of 5,500 rupees to be incurred in printing a Cochin Chinese Dictionary by Lithography in the manner

* The letter contains an admixture of Pálí words, but the substance is in Bengálí, and is evidently a very imperfect rendering of the author's expressions by a Bengálí writer.

proposed by the author; but his Lordship would prefer much, that in order to make the work accessible to seafaring persons and traders as well as to the learned, the explanation should be given in English as well as in Latin, and that a Vocabulary rendering the common English words into Cochin Chinese should be added to the volume.

2. His Lordship would hope that by compressing the writing in the page which is rather wide in the specimens transmitted, these additions could be brought nearly within the same compass so as to occasion very little additional expense.

3. The specimen which accompanied your letter is herewith returned.

I am, &c.

H. T. PRINSEP,

Council Chamber, the 20th July, 1836. *Secy. to Govt.*

In consequence of the above suggestions, the Secretary had, in consultation with the author, returned the following reply:—

To H. T. PRINSEP, ESQ.

Secretary to the Government of India, Genl. Dept.

SIR,

I have the honor to acknowledge the receipt of your letter, dated the 20th July last, communicating the acquiescence of the Right Honorable the Governor General of India in Council to the proposition submitted by myself, on the part of the Asiatic Society, and of the most Rev. the Bishop of Isauropolis, for the publication of a Cochin Chinese Dictionary in lithography at an expense not exceeding 5,500 rupees.

I have accordingly placed myself in communication with the author, with a view to arrange the preliminaries without loss of time, as well as to provide for the modifications recommended by his Lordship in Council.

The Bishop is of opinion that the addition of a column of English meanings to the Dictionary in its present form would involve a very serious increase of labour in passing it through the press; it would also augment the bulk of the work very considerably; while a very large portion of the words and explanations connected with literary and abstract terms would be of no utility whatever to the commercial class or to seafaring persons.

The object contemplated by his Lordship in Council may, he thinks, be supplied with more facility by the addition of a Supplementary Vocabulary containing all the most common words, which might also be published in a detached form for the use of mariners and traders.

This Vocabulary the author undertakes to draw up in the English, French, and Anamitan tongues, during the progress of the publication; and precaution has been taken to include this additional matter in the estimates which have been called for.

His Lordship's remarks on the appearance of the lithographed specimen, and the obvious advantage, if possible, of securing to a standard work of this nature the advantages and neatness of typography, induced me to communicate again with the Proprietors of the Serampore Press, before any final arrangements should be made.

The Bishop on his own part handsomely consented to relinquish 500 rupees out of the 4,000 rupees of personal remuneration for which he had at first stipulated. I was thus enabled to offer a clear sum of 2,000 rupees to Rev. Dr. MARSHMAN for the execution of 500 copies of a quarto volume, containing nearly 500 pages, with the native words in the Cochin-Chinese character. This offer, although much below the usual Calcutta printing rates for ordinary works, has been in the most liberal manner accepted by the Rev. Dr. and Mr. J. MARSHMAN.

I now therefore only wait for the final sanction of Government to place the MSS. &c. in their hands.

I am, &c.

(Signed) JAMES PRINSEP,

Calcutta, 1st August, 1836. *Secy.*

To this letter the following reply had just been received :—

To JAMES PRINSEP, Esq.
Secretary to the Asiatic Society.

SIR,

I am directed by the Right Honorable the Governor General of India in Council to acknowledge the receipt of your letter dated the 1st instant, and in reply to state that his Lordship entirely approves the arrangement made by you on the part of the Asiatic Society for the publication at the Serampore Press of the Anamitan Dictionary prepared by the Most Reverend the Bishop of Isauropolis, at the charge already sanctioned, of 5,500 rupees.

2. The modifications made in the original proposition seem to his Lordship in Council calculated very much to improve the work, and entirely meet the wishes expressed in my letter dated 20th ultimo.

3. The Governor General in Council has much satisfaction in acknowledging the disinterested and public-spirited offer made by the Right Reverend author, to forego a portion of the remuneration allotted to him in order to obtain the advantage of having the work published in type ; and the terms accepted by Dr. MARSHMAN of Serampore appear to his Lordship in Council to be not less liberal ; for the rate at which they have agreed to print the work in the original character is such as can afford them little or no profit.

4. It is the wish of the Governor General in Council that additional copies should be printed of the Vocabulary proposed to be added ; and if this should occasion an increase of expense, his Lordship in Council will have no objection to defray the amount that may be charged on this account, taking for Government an additional 100 copies of this part of the work.

I am, Sir, &c.

Council Chamber, the 3rd Aug. 1836. H. T. PRINSEP,
Sec. to Govt.

The liberality of the proprietors of the Serampore Press in undertaking to print the work without any hope of profit, or even at the risk of some sacrifice, was fully appreciated by the Society, and the best thanks of the meeting were conveyed to Dr. MARSHMAN, who was present.

A bill from the Orphan Press for printing the 1st part of the twentieth volume of Researches, 248 pages, amounting to C.'s Rs. 1806 6 4, was presented and passed.

Oriental Publications.

The Secretary reported the completion of the *Naishadha-Cheritra* (1st part, 900 pages) one of the Sanscrit works transferred from the Committee of Public Instruction ; of which copies were ready for distribution. By the terms of agreement with the Editor, PREMA CHANDRA PANDITA, of the Calcutta Sanscrit College, who had supplied the tiká or commentary, 100 copies were to be given to him in lieu of pecuniary remuneration, which was approved.

Library.

The following books were presented :—

Results of Astronomical Observations made at the Madras Observatory during the years 1834 and 1835—*presented by the Madras Government, through Colonel Casement, Mil. Sec. Sup. Govt.*

Jahr bucher der Literatur, No. 69, 70, 71, and 72—*presented by the Baron Joseph Von Hammer.*

Notizia di Diciotto Codici Persiani della Biblioteca della Regia Universitá di Torino—*by the same.*

Memoire sur deux Coffrets Gnostiques du moyen age—*by the same.*

Mamik und Afra, a German Poem, translated from the Persian—*by the same.*

Historical Oriental Translations and Researches, 2 vols. quarto, by the Rev. W. TAYLOR, Madras—*presented by the author.*

Journal of the Royal Asiatic Society of Great Britain and Ireland, No. 4—*by the Society.*

A descriptive and illustrated catalogue of the Physiological Series of Comparative Anatomy, contained in the Museum of the Royal College of Surgeons in London, Vol. III. Part I.—*by the President of the College.*

The Sixth Annual Report of the Society of Natural History of the Mauritius—*by M. Julien Des Jardins, Sec.*

Madras Journal of Literature and Science, No 12, for April and July, 1836—*by the Madras Literary Society.*

The Indian Journal of Medical Science, No. 8, and Review of Works on Science—*by F. Corbyn, Esq. the Editor,*

Meteorological Register for June 1836—*by the Surveyor General.*

The following books were received from the booksellers:—

Lardner's Cabinet Cyclopedia—Botany, 1 vol.

————, Foreign Statesmen, vol. 2nd.

Museum.

Read a letter from J. BELL, Esq. Secretary Agricultural and Horticultural Society, forwarding for the acceptance of the Society two blankets and two woollen cloths on behalf of Lieutenant H. VETCH.

The blankets are made from the *Símál* tree; the woollen cloths are of Bhotian manufacture.

Literary Communications.

The Government of Madras referred for the consideration of the Society, through the Supreme Government, a proposition submitted by CAVELLY VENKATA LACSHMIA, Pandit, to re-establish the system of Historical Research so successfully pursued by the late Col. COLIN MACKENZIE in the Peninsula, by collecting inscriptions, manuscripts, grants, &c. as well as to translate and digest the mass of materials already collected, and now in the possession of the Royal Asiatic Society.

CAVELLY VENKATA had drawn up a report-progress of the researches, in which he states himself to be still engaged, classifying the different dynasties, ancient and modern, of South India, on which light has been thrown by the Mackenzie collection. This paper and the correspondence were referred to the Committee of Papers for their examination and report, previous to discussion of the question in the Society.

Mr. W. H. MACNAGHTEN presented an elaborate Memoir by Lieut.-Colonel BURNEY, Resident in Ava, entitled "An account of the wars between Burmah and China, together with the journals and routes of three different embassies sent to Pekin by the king of Ava, taken from Burmese documents.

[Referred to the Committee of Papers. This account has peculiar interest at the present moment, when the offer of Mr. GUTZLAFF to penetrate through China to Ava or Assam has been much discussed.]

Mr. TREVELYAN on behalf of M. C. MASSON presented a third memoir on the coins discovered at Beghram.

This paper is a careful and laborious recapitulation of all that has been done in this curious branch of discovery, with the addition of the results of a third year's search. The acquisition of new coins and new names naturally becomes every day more rare; so that notwithstanding the addition of 2,294 coins to his

cabinet in the year 1835, the only real novelties are an unique coin of ARCHELIUS, one of DIOMEDES (found in 1834) the confirmation of ADELPHORTOS and IPALIRISUS. Three Euthydemus', and one Antiochus have been gained; the ratio of the more common Bactrian and Indo-Scythic names is much the same as in former years. We shall hasten to publish such portions of M. MASSON'S most industrious labours as have not hitherto appeared in our pages.

Mr. AVDALL brought to the Society's attention a singular narrative, in translation, of the interview between ARSACES, king of Armenia, and the Persian Monarch SAPOR (ALAKNAF.)

[We hope to find room for this curious morceau ere long.]

The Secretary read extract of a letter from the Counsellor JOSEPH VON HAMMER, of Vienna, (now Baron PURGSTALL,) forwarding a continuation of his translation of the *Mohit*, an Arabic nautical work by SIDI CAPUDAN, of which the first chapter was printed in the third volume of the Journal.

The present chapter contains a catalogue of the islands along the shores of the Red Sea, and directions for thirty different voyages from Loheia, Aden, &c. to the various ports of India, Persia, and the Straits of Malacca. It is a fact difficult to be accounted for, that the learned author offered to translate the whole of this very scarce and curious work for the Oriental Translation Committee, who have given to the world so many of less consideration; but he was not honored with a reply.

Extracts were also read from other European Correspondence. Professor WILSON reports his having forwarded the Society's memorial regarding Oriental publications to the Royal Asiatic Society, which, in concurrence with the Oriental Translation Committee, had warmly espoused the object of its prayer. The Foreign Societies had also supported it, as far as the voice of protestation and argument by a body of the most distinguished oriental scholars can lend its influence.

Paris has set a further example which it would be unjust to the cause to omit mentioning.

Colonel TROYER, having presented to the Société Asiatique a German translation of the first six books of the *Ráj Tarangini*, (one of the Sanscrit works suspended by the Government order, and lately completed by the Society here,) was invited to undertake a French version of the same for publication *with the Sanscrit text* at the Society's expence, estimated at not less than 6,000 francs. It may be hoped that the edition completed in India, of which specimens must soon after have reached Paris, will spare a portion of this money for the many other objects embraced by this active association.

M. JACQUET announces the contemplated institution of a new professorship of the Oriental languages in the University of Ghent, which well desire to accumulate manuscripts and printed works from this country. The late discovery of coins and inscriptions in India had excited the most intense interest on the Continent, but General VENTURA'S collection had not yet reached Paris, on account of the detention of General ALLARD by illness in the South of France.

With regard to the coins of the Kadphises group, M. JACQUET having seen HONIGBERGER'S collection would read the name *Mokadphises*, which he suggests to be *Mahátricha* of the Sanscrit. We await his papers on this subject in the *Journal Asiatique*.

Physical.

A collection of specimens made by Captain HANNAY in his recent expedition up the Irawadí to the Amber mines, was presented by Colonel BURNEY.

The collection includes many varieties of white and gray marble—serpentine, agates, jaspers, heliotrope and crystal, particularly a pale

green prase, much prized by the Chinese, and called by them *Yu;* it is found about 80 miles N. W. of Mogaung. Wrist rings are cut from it.

With the specimens was a substance called by the Burmese *earth wax*, which they say exudes from some high precipitous rocks above Ava. They add, that monkeys are particularly fond of this substance, and that those animals swarm about the rocks which yield it. The wax has all the appearance of common unbleached wax.

There was also a specimen of the tea prepared by the Singphos of Payendwen; and a poisonous plant used by the Mishmís, supposed by Dr. WALLICH to be identical with the *Bish* of the Gurkhas, (Aconitum;) another herb *myenthé*, used by the Mishmis for the same purpose, had more the appearance of an Acanthaceous plant.

The fossil bones from Perim in the Cambay Gulph, presented by the Baron HUGEL, had arrived. Among them is a large and indisputable fragment of a buffalo's horn, which the Baron refers with probability to the Nerbudda fossil bos; two smaller horns imbedded in matrix, (a calcareous and ferruginous conglomerate.) Also shells from a similar conglomerate in Gogo, and specimens of the cornelian, natural and burned, from the *Ratanpur* quarries.

A geological series from Pulos Floer, Trotto, Ledah, Tingy, Pigeon Island, Birdnest Island, and Dehli point, in the Straits of Malacca, was presented by Dr. BLAND, of H. M. S. *Wolf*, with a note of their locality, and some remarks on the genus of shells denominated *Pterocyclos* by BENSON (*Spiraculum* by PEARSON), found in abundance on the islet of Susson, opposite Queda Peak.

[Dr. BLAND'S notes shall have early insertion.]

Specimens of a calcareous and silicious Scoria, forming the substance of a small hill at *Búdigúnta* near Courtney, about 11 miles west of Bellary, was presented by Lieut. NEWBOLD.

[The accompanying note will be inserted.]

Mr. C. W. SMITH having purchased a collection of specimens of Natural History from the Eastern Isles, presented the Mammalia, the duplicates of the Birds and the Reptiles, to the Museum, on condition of the remaining birds being mounted for him. The Mammalia and Reptiles consist of the following specimens:—The grey Roussette, (*Pteropus Griseus*) two specimens; one of a species of *Noctilionina*, and one of *Vespertilionina*, probably new genera; one of a species of Marten, agreeing in specific characters very exactly with the Pine Marten, (*Martes Vulgaris;*) two young specimens of a species of Ictus; one of the Barang Otter, (*Lutra Lutreola?*) one of the slender Delundung, (*Prionodon Gracilis;*) one of the Sumatra Cat, (*Felis Sumatrana;*) one of the Madagascar Squirrel, (*Sciurus Madagascariensis;*) one of the Jeralang, (*Sciurus Leschenaultii;*) two of the two-banded Squirrel, (*S. Bivittatus;*) and two specimens of the Java Musk Deer, (*Moschus Javanicus.*) The Reptiles are a specimen of the Eastern Box Terrapia, (*Cistuda Amboinensis;*) and one of the Clouded Monitor of GRAY'S Synopsis, (*Monitor Nebulosus.*)

A specimen of Bengal Vulture, (*Vultur Bengalensis,*) presented by Major FANE.

The specimens of birds presented at the last meeting were exhibited, having been mounted in the Museum.

Physical Communications.

A memoir on the Fossil Rhinoceros of the sub-Himálayas, was forwarded by Lieuts. BAKER and DURAND, of the Engineers.

[This, with the lithographs and engravings kindly prepared by the authors themselves for the Journal, will be published in the ensuing number.]

Mr. HODGSON, of Nepál, continued his contributions of new species in two papers: 1, on the thick-billed finches; 2, on two genera of Columbidæ. Twenty-two ornithological plates were also added to the magnificent series of illustrations now under dispatch home.

A note on nest of the Bengal Vulture was submitted by Lieutenant HUTTON.

A Register of Rain at Delhi, by the Rev. R. EVEREST.

A living specimen of the new genus of venomous snakes denominated *Hamadryas* by Dr. CANTOR, was exhibited to the Society; it measured nearly 10 feet in length, and was caught in the *Sundarbans*.

VII.—*Miscellanea.*

Madras Journal of Literature and Science.—It has not been hitherto our custom to enter into criticism of the contents of contemporary journals, but we cannot refrain from noticing the number issued by our sister society of Madras in July, which has just reached us and has excited—not our envy, but—our astonishment and our joy.—To say that it rivals or eclipses our own humble production in what is called "the getting up," would be, perhaps, considered little of a compliment. The fresh zeal and exertions of a new editor, (Dr. COLE,) are not less conspicuous in the judicious selections he has made from other works, and the valuable notes with which he has embellished them, than in the host of able contributors he has summoned to his aid;—some of whom, alas! we have hitherto boasted as our own*, but whose transfer of allegiance is but natural, when so legitimate a rival arises to claim it. The present number (four-monthly?) contains 240 pages, price only 3 rupees. Of its most rich contents we should be tempted to glean with unsparing hand, could we afford space. Dr. BENZA has another excellent geological paper on the country between Madras and the Nilgíris. Mr. COLE has done a service to geology, by an accurate definition and description of the *laterite* formation.—Mr. TAYLOR'S view of the present state of astronomical science is highly interesting. It shews, that he is not one of those who merely keep up a supine routine of accustomed observations, but that all his observatory does is directed to useful ends—to the elucidation of those desiderata in the science for which its situation is best calculated. Nor is he a *Flamstead*, jealous of giving his labours into other hands, and tardy in working out results himself; for his *third volume* of observations, reduced and classified in the most compendious manner, has just issued from the Madras press. We may be indeed jealous that our Presidency should boast no similar production, and that even the astronomical labours of the Grand Trigonometrical Survey in the northern mountains should be as inaccessible and unknown as all their other operations! Colonel MONTEITH, Engineers, whose survey of part of Persia we noticed some time since, is imparting the statistical contents of his note book, accumulated during 18 years' residence in Persia. An account of the Thuggee system, by Lieutenant REYNOLDS—Observations on original and derived languages, by the Rev. B. SCHMID, and on the language of the Battas of Sumatra, by Lieutenant NEWBOLD, and the Rev. W. TAYLOR, are amongst the most interesting contents of this very creditable volume.

* Dr. BENZA, Mr. T. G. TAYLOR, Lieut. NEWBOLD.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of July, 1836.

Day of the Month.	Observations at 10 A. M.									Observations at 4 P. M.									Register Thermometer Extremes.		Rain.	Wind.			Weather.		
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Wet Barometer at 32°.	Difference.	Thermometer in air.	Wet-bulb Thermom.	Leslie's Dif. Hygrom.	Dew point at 9 A. M.	Hair Hygrometer.	New Stand. Barometer red. to 32°.	Old Stand. Bar. at 32°.	Wet Barometer at 32°.	Difference.	Thermometer in air.	Wet-bulb Thermom.	Leslie's Dif. Hygrom.	Dew point at 2 P. M.	Hair Hygrometer.	Cold on roof.	Heat in sun on roof.		Morning.	10 A. M.	4 P. M.	Morning.	10 A. M.	4 P. M.
1	29,516	29,544	29,366	—,178	85,8	4,0	3,1	77,0		29,424	,462	29,256	,206	89,1	7,8	5,7	76,8		77,2	91,2		SW.	SW.	sw.	fine.	fine.	gathering.
2	,479	,510	,323	,227	86,4	6,5	5,0			,392	,432	,234	,198	87,9	7,7	5,7	75,8		79,0	90,0	0,75	S.	SW.	sw.	do	cumuli.	showery.
3	,514	,552	,370	,182	82,4	3,4	2,8			,429	,478	,290	,188	84,7	5,2	3,2	77,5		75,2	87,0	,10	SW.	sw.	sw.	overcast.	rain.	clear.
4	,512	,547	,364	,183	83,5	3,5	3,5	76,0		,420	,486	,258	,228	88,3	7,1	5,0	76,0		76,0	108,5	,35	o.	s.	se.	cum. strat.	fine.	cum. strat.
5	,527	,570	,392	,178	83,9	5,1	4,0	77,4		,423	,481	,268	,213	87,8	7,9	4,8			72,0	115,0	,60	E.	se.	se.	do	hazy.	showery.
6	,548	,596	,408	,188	84,9	4,4	3,4	76,5		,422	,471	,278	,193	85,9	5,2	3,1	79,9		73,6	97,0	,60	o.	ne.	se.	clear.	showers.	rain.
7	,518	,561	,370	,191	85,5	4,9	3,8	78,5		,395	,463	,231	,232	89,2	7,6	5,7			76,0	101,0	,20	ne	ne.	ne.	cloudy.	haze.	cum. strat.
8	,490	,542	,357	,185	83,7	3,5	2,7			,402	,461	,250	,211	86,8	6,8	5,0	78,4		76,2	91,0	,30	E.	ne.	ne.	cumuli.	showers.	showery.
9	,507	,532	,356	,176	85,8	4,7	3,6	78,5		,421	,465	,269	,196	84,3	2,6	2,3	79,8		75,5	98,0	2,00	Ese.	E.	o.	do	dull.	cu. strat.
10	,517	,552	,377	,175	85,1	4,7	3,6	78,0		,416	,457	,273	,184	85,1	4,0	2,5	79,8		74,6	105,3	,30	E.	se.	o.	do	cum. strat.	threat.
11	,460	,490	,319	,171	83,1	4,1	3,5	76,2		,352	,412	,212	,200	84,2	5,0	3,5	76,3		76,2	95,2	,10	E.	ne.	o.	rainy.	do	overcast.
12	,515	,445	,284	,161	82,7	2,8	2,8	79,2		,351	,380	,208	,172	84,3	4,5	3,5	77,3		74,2	90,0	,60	E.	e.	E.	heavy rain.	rain.	showery.
13	,515	,560	,392	,168	82,7	2,5	2,0	78,7		,442	,488	,290	,198	85,1	5,3	3,9	77,1		73,0	85,2	,55	E.	e.	se.	nimbi.	do	fine.
14	,528	,547	,387	,160	81,6	2,6	2,1	76,5		,441	,490	,312	,178	81,5	2,5	2,1	77,8		75,3	80,0	1,10	S.E.	E.	se.	rain.	haze.	overcast.
15	,580	,607	,460	,147	80,7	1,9	2,3	78,2		,519	,565	,391	,174	83,9	3,6	2,4	78,4		73,8	84,0	1,05	Sw.	E.	se.	cum.	rain.	scud.
16	,575	,616	,442	,174	83,1	2,7	2,2	78,5											73,0	94,2	,25	Sw.	se.		do	nimbus.	
17	,615	,656	,479	,177	83,7	1,9	2,2	79,0											74,5	87,0		Sw.	sw.		fine.	cum. str.	
18	,601	,638	,447	,191	85,3	5,3	4,4	77,0		,514	,565	,373	,192	84,3	2,4	2,6	78,6		76,2	88,0	,30	Sw.	sw.	se.	do	fine.	showery.
19	,539	,591	,406	,185	83,4	6,0	5,0	76,8		,422	,471	,268	,223	86,3	6,6	5,4	76,5		76,7	97,5		Sw.	sw.	sw.	cum. str.	do	hazy.
20	,458	,514	,322	,192	83,5	4,8	3,7	76,7		,365	,432	,210	,222	86,9	6,6	5,3	76,7		77,5	94,0		Sw.	sw.	se.	cumuli.	cir. cum.	threatg.
21	,470	,520	,324	,196	84,5	4,5	3,4	77,0		,392	,441	,248	,193	83,5	3,4	2,6	78,4		74,2	105,0	1,05	e.	sw.	se.	fine.	cum. strat.	showery.
22	,581	,614	,438	,176	83,9	4,6	3,1	76,9		,503	,559	,364	,195	85,9	5,7	3,6	78,0		75,0	92,0	,45	se.	sw.	se.	do	haze.	do
23	,634	,677	,489	,138	85,0	4,3	3,3	77,2		,542	,545	,399	,146	85,0	5,1	2,7	76,6		75,4	89,0	,50	s.	se.	s.	do	fine.	do
24	,632	,682	,492	,190	85,3	5,1		75,6											74,8	99,1		S.	se.	s.	do	do	
25	,658	,710	,511	,199	85,6	5,7	4,4	77,8		,533	,610	,372	,238	89,7	9,4	7,2	75,7		74,5	97,0		Sw.	se.	sw.	do	cir. strat.	cum. str.
26	,637	,685	,487	,198	85,5	3,3	4,4	76,5		,531	,604	,366	,238	90,4	8,8	6,6	77,8		77,0	97,7		S.	s.	sw.	do	fine.	showery.
27	,643	,702	,490	,212	86,3	6,7	5,6	77,0		,530	,610	,354	,256	90,5	9,9		76,0		77,7	95,3		S.	se.	sw.	do	do	cum. strat.
28	,629	,686	,490	,196	85,5	6,1	5,6	76,0		,503	,570	,348	,222	87,1	7,8	7,3	76,3		77,2	92,5		S.	sw.	sw.	cum. str.	hazy.	hazy.
29	,622	,673	,480	,193	85,6	5,8	5,6	75,6		,518	,588	,360	,228	88,8	6,8	6,0	77,5		79,2	85,0		S.	sw.	sw.	rain.	fine.	showery.
30	,643	,696	,500	,186	82,2	3,4	3,9	70,4		,530	,595	,389	,196	85,1	4,6	4,3	77,4		74,5	96,7	1,00	o.	s.	w.	rain.	showery.	cloudy.
31	,574	,610	,443	,167	81,7	4,5	3,4	74,6		,466	,521	,335	,186	81,2	4,4	3,8	75,8		74,2	89,5	,20		sw.	se.	overcast.	overcast.	fine.
Mean,	29,556	29,595	29,411	,185	84,1	4,3	3,6	76,		29,450	,504	29,304	,204	86,2	5,8	4,3	77,4		75,4	93,8	12,35						

In the present month the old standard barometer has been read off with its compensation index.—The hair hygrometer has been employed in other experiments; the sulphuric acid is of spec. grav. 1.48

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 56.—August, 1836.

I.—*Extracts from the* MOHIT *(the Ocean), a Turkish work on Navigation in the Indian Seas. Translated and communicated by* JOSEPH VON HAMMER, *Baron* PURGSTALL, *Aulic Counsellor, and Prof. Orient. Lang. at Vienna, Hon. Memb. As. Socy. &c. &c.*

[Continued from vol. iii. p. 553.]

[We know not how to express sufficient gratitude to our illustrious correspondent for his courtesy in allowing these pages to be the medium of publication of this curious manuscript of SÍDÍ ALI CAPUDAN. The manner in which it was discovered by the Baron at Naples, after 30 years' fruitless inquiry, was described in the preamble of the former extract. The value set upon it by this eminent oriental scholar, induced him to offer to translate the whole for the Oriental Translation Committee; but through some accident, (we can ascribe it to no other cause,) an offer so generous has remained unacknowledged. "Without doubt," our correspondent writes, "the book would deserve much more the care of the Committee than many of minor interest published by it; but although to my volunteer I got no more answer than to my offer of an edition and translation of WASSOF, *agar hájat báshed*, as the Persians say, and with the assistance and remarks of some Indian sea-faring gentlemen on the parts already translated, I hope to send chapter after chapter to your Indian Journal, and thus we shall be independent of the Committee."

On the last occasion we derived some little assistance from the *Nakhodas* of the Arabic vessels, in recognizing the places alluded to in the Section on the monsoons. The same plan we have been prevented, in a great measure, from following now, through the absence of these traders, who only arrive here towards the end of the south-west monsoon (August-September) and return with the setting in of the north-east wind in February-March. We have, however, been able to trace most of the principal names on the map, and have marked them in foot notes. The catalogue of the names of islands in the Red Sea would be—and may, we hope, still be—of great use to the officers of the Indian navy now engaged in its survey.

We have discovered many of the islands and capes mentioned by Sı'dı' in the large manuscript chart sent round for the use of the steamer *Forbes* in its passage up the Red Sea: but by far the greater number of islets remain unnamed; and to them, with a little local inquiry, Sı'dı''s list might doubtless be easily applied. The book is also of great service in pointing out the maritime channels of Arab commerce, at the period perhaps of its highest prosperity, before the Portuguese, the Dutch, and the English had diverted the majority of the Europe supply to the newly discovered route by the Cape of Good Hope.

The Baron* is in hopes that the presence of sea-faring Arabs will also enable us to assist him in understanding the prior and more difficult chapters of the work, wherein is discussed the manner of "making the pole," (جاء,) or taking the altitude of the polar star. Here, however, we have little chance of success. The present navigators have adopted the improved methods of Europe:—they take their latitude by the sun, and with the modern sextant; and the richer merchants even provide their vessels with chronometers:—not that the Arabs yet possess translated tables or ephemerides by which to work the course themselves; but they almost universally employ an English sailing master, to whose superior intelligence they implicitly confide.

Nothing then have we been able to learn of the instrument used by the early navigators in taking their latitude from the circumpolar stars; or of the measure of an arc called *issabâ* (اصبع) inch, and its subdivision into eight *záms* (زوام) We find however on inquiry that the latter term is still applied to terrestrial measurement, and is well known to nautical people of the present day as the fifth part of a geographical degree, (twelve nautical miles.) Though this measure does not at all accord with the sailing distances quoted by Sı'dı' Capudan, from well known places, it will be seen presently to correspond exactly with the value of the celestial inch or *issabâ* as deduced from the internal evidence of the work itself.

The Baron Hammer in his private letter to us writes thus: "Concerning the measure of زوام the first section of the IIIrd. chapter explains as follows: 'The *zám*, زام, is either the *practical* one, عرفي, or the *rhetorical*, اصطلاحي†; The *practical* is one of the eight parts in which day and night are divided: the *rhetorical* is the eighth part of an inch, صبع, in

* It seems we erred in giving that designation to Counsellor Von Hammer in 1833; but our announcement proved prophetic; the Emperor having conferred the title on him in December 1835, upon his succeeding to the little state of Hoinfeld, bequeathed to him and his male descendants by the late Countess Purgstall (Cranstoun). The present paper is a proof that this accession of honors will not detract from the zeal of his Oriental studies.—Ed.

† We are inclined to think that this word اصطلاحي *istilahiy*, is an error of the transcriber, and that it should be اصطرلابي *usturlábiy*, appertaining to the divisions of the astrolabe.—Ed.

the ascension, ارتفاع and descension انحطاط of the stars. For example, if you go north and make the star جدي, *eight zám;* it is elevated one inch: and if you go south, it is by eight *záms*, one inch depressed منحط. This is the whole section on the measure of the زام (plural, الزوام) an explanation which, however, helps me not a bit to understand the true measure of a *zám*, in the reckoning of the ship's course so frequently employed in the subsequent chapters. Nor have I been able to obtain any explanation from our astronomers."

We will now venture to offer the explanation which has occurred to ourselves from perusal of the present translated chapter of voyages, and the above extract conjointly.

1. The *zám*, in practical or vulgar parlance, is said to be the eighth part of the day and night. This, doubtless, applies to the nautical division of the twenty-four hours into 8 watches, generally prevailing among oriental nations, and exactly corresponding with the 8 *pahars* of the Hindus*.

2. Again, the *zám* is seen above to be the eighth part of the ordinary inch or *issabâ;* as the *jo*, or *yava* of the Hindus, is the eighth of their *angúl:* and the *line* of Europeans is the eighth of their inch: it is, in fact, the vulgar subdivision by two and two, both of the unit of measure and of time. Perhaps, indeed, *zám* may be a mere corruption of *jo*.

It would seem, that to suit ordinary capacities, both the *issabâ* and the *zám* had been transferred to the arc of the rude quadrant or astrolabe used by the Arab seamen, in lieu of the more scientific division into degrees and minutes. Or it is very possible that in still ruder times the altitude of the polar star above the horizon was actually measured by fingers' breadths, the hand being held out at the natural arms' length in front of the face: for the measure of the arc thus subtended would nearly agree with the value of the *issabâ* derived from other considerations.

The actual value of the *issabâ* in degrees and minutes may be readily found from the latitudes, or polar altitudes, of known places extracted from Sí'dí's work. Thus the elevation of the pole Cape Guardafui is always quoted at $4\frac{1}{8}$ inch; while at Jedda it is called 10 inches; difference, $5\frac{7}{8}$ inches. The difference of latitude by our mode of reckoning is 21° 28′—12°, 00′ = 9° 28′; which gives nearly 1° 37′ for the *issabâ* or inch. Now, as before stated, we were informed by an Arab *Muallim* that the *zám* was 12 of our minutes, or 5 *záms* = 1 degree. Therefore, 8 *záms* or 1 *issabá* should be equal to 96′; or 1° 36′,—so close an accordance with the foregoing result, as to leave no doubt of the value of the *issabá* and *zám* being 96′ and 12′ respectively on the celestial arc.

It still remains to explain the divisions of the lower arc of their rude instrument, and the *kiás*, or point at which the readings of the upper and lower index coincide, as also the point whence the divisions commence on both quadrants, or what may be called their index error.

* The subdivision of the *pahar* into eight *gharis*, is like the "eight bells" into which our nautical watch is counted off.

In the description of the islands of the Arabic coast, it will be seen that as the readings of the upper limb increase, those of the lower quadrant decrease, their sum being constantly $14\frac{1}{4}$ *issabâ.*

Thus, at *Saibán*, (Loheia,) the upper reading is $6\frac{3}{4}$, lower $7\frac{1}{2}$, sum $14\frac{1}{4}$.
at Jedda, ditto 10 „ $4\frac{1}{4}$ „ $14\frac{1}{4}$.

It is evident, therefore, that the *kiás* occurs at $7\frac{1}{8}$ inch, or 7 *issabâ* 1 *zám*, the half of $14\frac{1}{4}$.

Again, for the zero point we have the following data :—

	true lat.	*issabâ*			*zero point*
By the Jedda latitude, ...	21° 28′	— 10 ×	1°	36′ (= 16° 00′)	= 5° 28′
By the Guardafui, latitude ,.....	12 00	— $4\frac{1}{8}$ ×	1	36 (= 6 36)	= 5 24
By Darwesh, or Dorish, ...	18 30	— 8 ×	1	36 (= 12 48)	= 5 42
By Loheia or Saibán, ...	15 41	— $6\frac{3}{4}$ ×	1	36 (= 10 48)	= 4 53
By Wasaliat, (Fossailiat,)	17 42	— $7\frac{1}{4}$ ×	1	36 (= 12 24)	= 5 18
By Danek, ...	19 31	— $8\frac{1}{2}$ ×	1	36 (= 13 32)	= 5 59
By Haseek sinave, *(Harik-simár)*,	19 50	— $8\frac{3}{4}$ ×	1	36 (= 13 56)	= 5 54

The average index error or zero point is thus found to be 5° 31′, or in round terms $5\frac{1}{2}$ degrees, to be added to altitudes taken by the *issabâ* scale. The only conjecture we can offer as to the origin of such an arbitrary arrangement is, that the zero has been fixed at the lowest elevation at which it is safe to trust to the measurement by the polar star : so that mariners, on finding *polaris* fall below 0 inches, would then know they should take their latitude by *Farkadain*, or β and γ ursæ minoris.

The zero point of the under quadrant may be easily deduced from the foregoing to be at 28° 18′ below the horizontal line. This we may suppose was the highest elevation of the polar star observable by navigators in the Red Sea or in the Persian gulph. Indeed the latitude of Suez and of the mouths of the Euphrates, the most northerly ports visited by their ships, being 30°, the difference between this and 28° 18′ is very nearly equal to the north polar distance of *polaris* (1° 42′) : and in the period from January to July it would be only the inferior meridional passage that could be observed. It is generally supposed that the early astronomers regarded the polar star as stationary, and did not trouble themselves to attain even the accuracy we are giving them credit for; but an expression, which occurs in a following page, shows that this was not the case ; since it directs, that ‘ if it be not time to take the polar star, then another star is to be substituted.’

As a proof, however, that no great accuracy was attainable, it may be remarked that the two stars called by the Arabs *Farkadain* (β and γ ursæ minoris) are accounted to have the same altitude; whereas in reality there is a difference of no less than three degrees in their declination ; but it is probable that the altitude was taken constantly by either the upper or the lower star, although we have no data here to decide this point.

The following table will be found very useful for the conversion of *issabâs* into degrees and minutes. In it the quadrantal difference of the *Farkadain* is assumed at $6\frac{7}{8}$ *issabâ*, or 11°+ 5° 30′, = NPD 16° 30′, which is nearly the average north polar distance of the two stars.

North Latitude.		*Elevation of Polaris.* [*at his inferior meridional passage ?*]				*Elevation of Farkadain.*	
Degrees.	Minutes.	*By upper quadrant.* Issabâ.	Zám.	*By lower quadrant.* Issabâ.	Zám.	*By upper quadrant.* Issabâ.	Zám.
0	0					3	3½
0	54					4	0
2	30					5	0
4	6					6	0
5	30	0	0	14	2	6	7
7	6	1	0	13	2	7	7
8	42	2	0	12	2	8	7
10	18	3	0	11	2	9	7
11	54	4	0	10	2	10	7
13	30	5	0	9	2	11	7
15	6	6	0	8	2	12	7
16	54	7	1 (kiâs)	7	1		
18	18	8	0	6	2		
19	54	9	0	5	2		
21	30	10	0	4	2		
23	6	11	0	3	2		
24	42	12	0	2	2		
26	18	13	0	1	2		
28	18	14	2	0	0		

With regard to the value of the *zám* in terrestrial measurement, 12′ or 12 nautical miles* would perhaps be applicable to many of the instances in Sí'dí"s work ; for example, where he directs that in running down the Malabar coast the navigators should keep five *záms* distant from the shore, or 72 miles, which is the common practice. But to suit other cases, the *zám* must be assumed at half a degree or upwards ; and this is probably attributable to the very erroneous notions of the longitudinal distances of places prevalent before good charts were formed. With the aid of a map, however, and the bearings given by our author, it is easy to describe the track of his several voyages. We have thus derived the probable measurements given in the following notes, in which we have also given the names of the places on our charts where they were recognizable.—Ed.]

THE NINTH CHAPTER.

Containing an explanation of some Islands and Voyages, and precautions, the knowledge of which is requisite for Navigators in the Indian Seas.

First Section.—*The islands of the Arabic coast*†.

The island *Okbán*[1], north of which the island *Katáma*[2], afterwards *Sil Nobán*[3], the island *Sána*[4], then the two islands *Badhiáin*[5], the environs of which are shallow ; after them the islands *Zútheláth*[6], the

[1] عكبان [2] كتامه [3] صيل نوبان [4] سانه [5] بضيعين [5] ذوثلاث

* Has the terrestrial *zám* any connection with the *jojan* or *yojana* of the Hindus, which is estimated at somewhat more than 10 miles ?

† This enumeration of islands commences from near Loheia, lat. 15° 41′ on the Arabic coast, in front of which lie the islands of *Okbáne*, *Kotama*, and *Loban*, with *Camaran* a little to the south. Most of the rest are not to be found by name on Capt. Elwon's new chart,—Ed.

island *Hawal*[1], the island *Haula*[2]*, which is situated behind *Hawal;* the islands *Zú Kassár*[3]† through which great ships cannot pass; behind *Zá Kassár,* the island *Mokammar*[4]‡, and behind that the island *Hodaife*[5]§, on which are a few trees, and no passage between them on account of a great number of rocks; the island *Hodaife* is the last towards *Bákil*[6] on the seaside: the water is here very unclean. On the east side of them is a small island called *Masad*[7], but no passage between them; behind them the island *Jihán el Kebír*[8]‖, and near it on the nether side the island *Jihán ess-ssaghír*[9]¶: the sea between them is full of shallows, to east of them the island *Sásoh*[10] which is a great mountainous island: on the western side of it a shallow called *amariya*[11]. Approaching from the seaside the island *Sásoh* is in sight before the *amariya;* on this shoal the depth of the water is five fathoms *(kúláj.)* Between the two above said islands the great and little *Jihán* is also an *amariya* or shallow. Be it known that the cape of *Jazar Farsán*[12]** lies north between *Sharja*[13] and *Jazá*[14] on the sea side are the two islands *Zú Kharáb*[15]†† and *Zú Saláb*[16]. *Sásoh* is on the sea side of these two islands between south and west. On the sea side of *Sásoh* are two islands, each of which is called *Dohr jihán* (back of the world.) Be it known that the island of *Seil Mothan*[17]‡‡ is the end of the Persian islands: on the sea side and north side there is no coast except that of the island of *Irak Ozáb*[18]. The back of *Jazar Farsán*[19]§§, and the unclean places are on the side of *Irak Ozáb;* towards the east side lies the back of the island *Rakab*[20]; the most eastern of all is the island *Jozián*[21], from thence *Borrassli*[22] is in sight. There is a small

جهان الكبير[9] مسد[7] باقل[6] هديقه[5] مقمر[4] ذرقصار[3] حولا[2] حول[1]
جزا[14] شرجه[13] جزرفرسان[12] امريه[11] ساسوه[10] جهان الصغير[9]
عرق عزاب[19] جزرفرسان[18] صيل مطحن[17] ذوسلاب[16] ذوخراب[15]
براصلى[22] زيان[21] ركب[20]

* Howalí? on Abyssinian coast, 16° 30′, can hardly be intended.

† Rasher? below Camaran; the R. may be miswritten for K. (See p. 449).

‡ Ras Majarmla? 14° 30′. } there may be small islands so called from their

§ Hodeidah Cape? 14° 45′. } proximity to these capes.

‖ *Zebayer* islands, 15° 2′: the Z is probably a miswriting of K.

¶ *Gebel Zogar,* or *Zeghir* of map, on the 14th parallel of latitude.

** Theran? 17° 12′. The word *Farsán* is applied farther on to the Abyssinian coast,—it is probably an error of transcription.

†† *Gorab,* 17° 10′. ‡‡ *Mutharhane,* 17° 28′.

§§ Perhaps the Cape *Jazar Farsán* which is mentioned above.—H.

bank[1] called *Akdáf*[2]. After the island *Seil al Motahan* there is nothing but sea, but on the border of the sea at the left are two sandy islands called *Fossailiát*[3]*. At their lower extremity are the islands *Jazira-i Somra*[4]† and *Zahra*[5]. Be it known that on the sea side of *Rakab*[6] is a shallow in which the ground is visible, but is eight fathoms deep. Some say that parts of it are impassable for ships; this *amariya* or shallow is called *Ork*[7] *Fossailiát;* after (south of?) the *Fossailiát* are three islands called *Jámas*[8]‡. On the sea side towards the north is a great island called *Zokák*[9]§, and on the south side a long bank, on the out side of which are the breakers[10], called *Tihál*[11]‖ *Merír*[12], but the water has eight fathoms. This island and the above mentioned lie south on the sea side of mount *Ssabaya*[13]¶. From *Tihál Merír* in the direction of the sea side and towards the last is a *Mira* (shallow) called *Irki Isa* (Jesus's vein :) the shallowest water is there two fathoms and a half, and the deepest eight fathoms. All these *amariye* (shallows not to be used) are in the Arabic sea. After *Zokák* is a great island called *Maassaba*** on which are some trees; on its beginning[15] is a small ridge[16] called *Bodúr*. After *Maassaba* are four great islands, called *Bahr-ul-Kabír*, (the great sea;) the two most southerly are called *Lam*[17] and *Han*[18]*:* they are situated on the sea side of mount *Ssabaya;* after them is the ridge[19] *Ablaj*[20]††; on the south-west of it is a great bank[21] called *Shobi Yahya*[22]*;* on the north side of the island *Ablaj* is a mountainous bank, which is a long ridge, and extends till to the ridge of *Kimárí*[23], and is next the island *Faraye*[24]. Between them is a *Ritka*[25]*;* that is to say, a rock. On the sea side of the mountainous ridge is the island *Darwísh*[26]‡‡. On the sea and north side is a bank[27] called *Helya*[28]§§, and on the north side a great island called *Shobain*[29]‖‖; after it the island *Múshka*[30]¶¶, and

١ شعب ٢ اكداف ٣ فصيليات ٤ سمره ٥ ظهره ٦ ركب ٧ عرق ٨ جومس
٩ زقاق ١٠ طپوق ١١ طحال ١٢ مرير ١٣ جبل صبايا ١٤ معصبه ١٥ مطاع
١٦ ظهره ١٧ لم ١٨ هن ١٩ ظهره ٢٠ ابلج ٢١ شعب ٢٢ شعب عي ٢٣ قماري
٢٤ فرايه ٢٥ رتقه ٢٦ درويش ٢٧ شعب ٢٨ حايه ٢٩ شعبين ٣٠ موشكه

* Wussaleat, of Capt. Elwon's map, in latitude 17° 42′.
† Simer, east of ditto.
‡ Shab el jurmah, 17° 34′.
§ Zoogah, 18° 5′.
‖ Elalthaller? 18° 15′.
¶ A mountain on the coast? Gebel Tase Sharme?
** Massuba, 18° 14′.
†† Aboo Lelf (on the shore.)
‡‡ Dorish, 18° 31′.
§§ Halli? S. of Coomefiddah.
‖‖ Shabbane, 18° 44′.
¶¶ Mooshka.

west to it lies the island *Shíka*[1]*, which is also a great island; on the sea side a great bank[2] called *Shob Sowaidi*[3]; on the north and land side of the island *Shíkan* is the island *Zú Shajíh*[4]†. On the western side is a shallow[5] called *Irk-ul-oyúra*[6]; next to it a segment[7] called *Kitaei Zaidi*[8]. Afterwards on the sea and north side an island called *Tajedda*[9]‡, and on the sea and north side of this a ridge[10]§ called *Zohrai Kassr*[11], and an island called *Takshef*[12]: on its sea side a ridge[13] called *Zohrai Takshef*[14]; in the neighbourhood of this are great banks[15] called *Dakhakhín*[16]. Be it known, that between the islands of *Dánek*[17]‖ and *Tajedda* both are in sight, if there is no hazy weather[18]. These (of *Dakhakhín)* run down to *Danek* and *Tajedda* towards the west; from the *Dakhakhín* you see the island *Shobaz-zokár*[9]¶; these islands lie from *Dánek* towards the coast of *Yaman*, that is to say, south, on one side of *Shobaz-zokár* is the island *Wússúl Omm Dahresh*[20]: on the land side of *Dánek* towards Syria, that is to say, north, are in some distance some segments (portions of rock[21] ?) called *Ibn Saaid*[22]. The islands called *Dánek* are three: the first to the south is called *Shobaz-zokár,* and the next northern one *Khabíre*[23], on the sea side of it is a segment[24] called *Omm Moen*[25], north of which lies *Dánek*, the greatest of all; round it are four banks[26]. On the land side is a passage between them and *Dánek;* they are called *Mahdhan*[27], *Makhref*[28], *Korb*[29], and *Kebla*[30]. After *Dánek* are four islands called *Bahrezzihár*[31]; the name of the first is *Matata*[32]**, of the second *Jodair*[33]††, of the third *Marmá*[34]‡‡, and of the fourth *Zohrai Marmá.* On the land side of them towards N. N. E. is a segment[35] called *Zeinab*[36], and here N. the *Shob Salim,* a long bank; from here towards E. S. E. are three islands in sight. After *Zihár* follow two banks and two called *Homais*[37]; north of them are no islands, but only some

[1] شيكا [2] شعب [3] شعب سويدي [4] ذو شجيح [5] عرق [6] عرق العيورة [7] قطعة
[8] قطعة زيدي [9] تجدة [10] ظهرة قصر [11] ظهرة [12] ظهرة تكشف [13] ظهر [14] ظهرة تكشف
[15] شعب [16] دخاخين [17] دانق [18] غبار [19] شعب الذكر [20] وصول ام دهرش
[21] قطعة [22] ابن سعيد [23] خبيرة [24] قطعة [25] ام معين [26] شعب
[27] محضن [28] مخرف [29] قرب [30] قبلة [31] بحر الظهار [32] مطاطا [33] جدير
[34] مرما [35] قطعة [36] زينات [37] حميس

* Shaker, 18o 53′.
‡ Tegdah, 18° 58′.
‖ Dahnac, 19° 32′.
** Mutatoo, 19o 45′.
† Doshagea.
§ Marked dangerous patches in chart.
¶ Shab Assugga, 19° 22′.
†† Jedere.
‡‡ Murrmah, 2 isl.

segments, the names of which are *Rehál*[1], *Majrádíb*[2], and *Hakan*[3]; the last lies to the land side and north to *Majrádíb*; on the western side of *Hakan* is a segment called *Magharriya*[4] above *Kaidán*[5]; after it comes *Tofiya*[6]*, after it the segment *Ssorúm*[7]†, and afterwards *Shob Kamáni*[8]‡, which is in the height *Mantaj*[9]. Afterwards *Khoshaat*[10]§ on the height of *Ssámíma*[11]‖, after it *Irk-ghorábi*[12]¶, after it *Mesmári*[13]**, which is on the height of the Black Cape, *Rásol-aswad*††. These islands are the last of the Arabian seas.

Second Section. *Of the islands on the Persian*‡‡ *coast.*

The first are those of the islands *Dahlak*[14]§§ situated south; the first of these islands is *Mokaidah*[15], afterwards *Mahlatán*[16], then the island *Zúbbar*[17], afterwards *Zúkarsh Bent Aadái*[18]: on the sea side of *Zúbbar* and *Zúkarsh* is a bank[19] called *Zúlfokáa*[20]. After *Zúkarsh* is the island *Sífála*[21], afterwards *Balaja*[22]; on the sea side of it is the ridge *Bent Tamarkass*[23]; after it comes great *Háteya* and little *Háteya*[24]‖‖; afterwards *Dozúma*[25], afterwards *Taraza*[26], afterwards *Dalikáf*[27], afterwards *Delfaidal*[28], afterwards *Nahali*[29], afterwards *Ghobári*[30], afterwards *Jadlab*[31], afterwards *Kabihú*[32]; between these two is *Makhádha Bent Antar*[33]; afterwards *Harmal*[34]; this is the last of the northern islands on the sea side; but there are some islands on the western side near the shore. After *Harmal* towards the land side, and N. the island *Rúmiát*[35], afterwards *Auwáli Bent Hatem*[36]¶¶, afterwards *Auwáli Shúra*[37], afterwards *Ssíl Katín*[38], afterwards *Bent Alawa*[39],

صروم [7] طفيه [6] قيدان [5] مغريه [4] حقن [3] مجراديب [2] رحل [1]
مسماري [13] عرق غراب [12] صميمه [11] خشعات [10] منتج [9] شعب كماني [8]
ذوفرش بنت عالي [18] ذوبر [17] مهلطان [16] مقيدح [15] دهلك [14]
بنت تمرقص [23] بلجا [22] سفاله [21] ذوالغقاع [20] شعب [19]
نحلي [29] دلفيدل [28] دليقف [27] طرزه [26] دزومه [25] حاطيه صغيره، حاطيه كبيره [24]
حرمل [34] مخاصه بنت عنتر [33] قبيحو [32] جدلب [31] غبارى [30]
روميات [36] عوالي بنت حاتم [37] عوالي شورا [38] صيل قطين [35]
بنت علوه [39]

* Tutteffah, 21° 0. † Serome Cliff. ‡ Cobane. § Ul Cussar Shamier.
‖ Simama. ¶ Urgo Gorab. ** Moosmaree.
†† The Cape immediately south of Jeddah.
‡‡ By *Persian* it may be presumed *Abyssinian* must be intended. Perhaps فرسان is a miscopy for حبشان *Habshán* or افريقان *African*.
§§ *Dhalac*, near *Massua*. None of the islands of this groupe can be traced by the names here given, until we come to the northernmost.
‖‖ Two large islands north of *Dhalac*.
¶¶ Howalee Huttoob and Shœrah, 16° 30′.

afterwards the island of *Dafna*[1]. This island situated on the land side and N. is the last of the islands *Dahlek*. If you proceed from *Harmal* N. E. one day and night, your course leads you to the islands of *Tahyrát**, which are seven islands, four of which are situated on the sea side and three on the land side; one of those situated on the land side is called *Delkas*[2], one *Bent Hatem*[3], one *Tastahel*[4], and one *Ráka*[5]; the three on the land side are called *Zúlkoráb*[6]; after the four islands situated on the sea side are on the north two islands, a great one called *Mosámara*[7]†, and a small one called *Korb*[8]. On the western side of *Mosámara*, as far as the eye can reach, are two great islands and sandy shoals called *Loka*[9]‡ and *Dilsak*[10]; after them is on the north a great island called *Zúlkefla*[11], and further on three islands are seen. Next to them and at some distance from the shore near *Zú'l asela*[12] is an island called *Torinbo*[13]§. After *Zúlkefla* on the sea and N. side is a small island called *Tamarshah*[14]‖, there is a bank[15] and on it a rock resembling a chair. After *Tamarshah* north is the island, little *Bár-Músa*[16]¶, which is a little round island, on which are some tombs and trees and shrubs of tooth-pikes. To the N. of it, and at some distance, is the island *Bár-Músa Kabír*[17]**, a great island on which large trees are growing; afterwards, towards the land side, in the direction of W. N. W. is an island called *Bárkat*[18]††, and in the vicinity of it a bank[19] which is called *Shobi Rúmán*[20]. From *Bárkat* in the direction of true west is an island called *Músa Maitbán*[21]. Be it known, that if one of these two islands is seen, the other is hidden; but if you pass between them, both are seen. After *Bár-Músa Kabír* to the N. is the island *Hindjodr*[22]‡‡; this is the last of the northern islands on the sea side. On the south side of these islands is a great bank called the long one[23], and after it a small one. If you steer from *Hindjodr* true west, you come to the port *Masrika*[24], which is at the height of *Sawakín*[25]§§.

[1] دفني [2] داكس [3] بنت حطم [4] تستاهل [5] راكه [6] ذوالقراب
[7] مسامره [8] قرب [9] لوگه [10] دلسك [11] ذولقفله [12] ذوالاثله
[13] ترنبو [14] تمرشح [15] شعب [16] بارموسى صغير [17] بارموسى كبير
[18] باركت [19] شعب [20] شعب رومان [21] موسى ميطبان [22] هندجدر [23] شعب الطويل
[24] مسركا [25] سواكن

* Dahrat Abbeed, &c. 18o 15′.
† Mussarmroo, 18o 50′.
‡ Locha and Undeesellec.
§ Juttat Tromba.
‖ Timershear, 18o 56′.
¶ Barmosa Segera.
** In lat. 19o 13′.
†† Barkoot and its Shab.
‡‡ Hindee Geedam.
§§ Suakin, one of the chief ports.

THE THIRD SECTION.—*Of Voyages and indications of the coasts being near.*

FIRST VOYAGE *from Bábolmandam*[1] to mount *Zokar*[2] and *Saibán*[3]*; you go first in the direction N. W. by N. half a *zám*[4], then steering N. N. W. you come to cape *Zokar*, and mount *Arâ*[5] is in sight on the left side; if from *Zokar* you wish to proceed to *Kamrán*[6], and you steer N. by W. you come to *Rakba*[7]†. Here you see for the first time the island *Zasha*[8]‡. The course from *Zokar* to *Saibán* goes in the direction N. W. by which you come first to *Abauel*[9], and then to *Saibán*§, which are seen on the right. Be it known, that if you steer true west you come to *Mokaidah*‖, and if you take from *Saibán* the direction W. by N. you come to the two *Hátia* (the great and small one.) If from *Saibán* you follow the direction W. N. W. you come to *Bent Antar* and *Harmal*, which are islands of the Persian (African) coast; from *Saibán* going straight to the pole you come to *Badhiain:* from *Saibán* going N. by W. you come to the two islands *Jehán* (the great and small one), which are on the Arabian coast.

SECOND VOYAGE *from Saibán (Loheia) to Jedda.*

From *Saibán* to *Jedda* with an unfavorable wind, the voyage is performed from four inches to four inches by degrees in the following way. First from *Saibán* where the pole[10] wants a quarter to seven inches¶, you steer four *záms* N. W. and afterwards N. W. by N. If the contrary wind is very strong, the course to be steered is E. by N. and true east, or near it; if the wind is a middle one, you steer N. E. or N. E. by N. If in your measurement the inferior quadrant[11] gives an inch** and a quarter, the ship is on a spot distant seven inches (measurement) from the pole. If in this place the northern wind ceases, you may lay to or tack. If it blows a hard northern wind, you look for the Arabic coast, and go to *Badhiain*[12] or near it. On the sea side of *Badhiain* is a shoal *(amaria);* that is to say, a place where you see the ground of the sea; with a weak northerly wind you go to *Mokammar*, or in the vicinity of it. The said islands are one near the other. If the pole is seven inches and a quarter, and the inferior quadrant seven inches††, and a strong northern breeze, you go to *Esman* and *Mesed;* and if there is but

[1] باب المندم [2] جبل زقر [3] سيبان [4] زام [5] عرا [6] كمران [7] رقبة [8] زشة
[9] اباعل [10] جاه [11] مربع ثاني [12] بضيعين

* Assaban of maps, off Loheiá, 15° 41′; long. 42° 52′.
† Saddle island in the Zebayers? ‡ Rasher? § Or Loheia.
‖ Dhalac island. ¶ See introductory remarks, = Lat. 16° 18′.
** This should be 7¼ inches. †† Lat 17° 6′.

little of a northern wind, you go to *Jihán* and *Ssail-ol-mathanat*[1]*. If the pole is made by seven inches and half, and the inferior quadrant wants a quarter to seven, and the wind blows strong from the north, you go from thence to *Khobat*[2], where some shoals are seen; with a little northern breeze you go to *Fossailiát*†; if the pole wants a quarter to eight, and the inferior quadrant shows six and a half, and the northern wind blows strong, you go to *Fossailiát*, where it is the best to remain, because on its sea and north side is infinite rubbish, that is to say, unclean places; with a weak northern wind you go to *Maassabah*[3]‡ or to the island *Lam*[4]. If the pole is made by eight inches§, and the inferior quadrant marks six and a half ($\frac{1}{4}$?), and the wind blows strong from the north, you go to *Darwish*[5]‖ or near it; if there is but little northern wind you go to *Zoo Shajeeh*¶, where much precaution is required on account of the bank *Sowaiá*[5]. If the pole is made by eight inches a quarter, and the inferior quadrant marks six inches, and the wind blows strong, you go to *Dakha Khein*[7] or to the island *Takshef*[8] or near it. With a small breeze you go to *Dánek*. If the pole is made with eight inches and a half, and the inferior quadrant marks six inches** less a quarter, and the wind blows strong you go to *Dánek*, and with a small northern wind to *Hareik Semár*[9]. If the pole wants one quarter to nine inches, and the inferior quadrant marks five and a half (Lat. 19° 30′), and the wind blows strong, you come to *Hareik Semár*, and with a small northern breeze to *Báher-zehár*[10], with a small northern breeze you come to *Homais*[11], where you stop. If the pole is made by nine inches and a quarter, and the inferior quadrant shows five inches, you go to *Homais*, with a small northern breeze you go to *Ráhel*[12], or near it. If the pole is made by nine inches and a half, and the wind blows strong, you go to *Majrádíb*[13]†† or near it. With a small northern breeze you come to *Ssorúm*[14]‡‡ or near it; if the pole wants a quarter to ten, and the inferior quadrant shows four and a half, and the wind blows strong, you go to *Ssorúm*, and with a small northern wind you come to *Jedda*. If the pole is ten inches§§, and

[1] صبل المطحنته [2] خبت [3] مصعبه [4] لم [5] درويش [6] سويدي
[7] دخاخين [8] تكشف [9] حريق سمار [10] بحر الظهار [11] حميس [12] راحل
[13] مجرادیب [14] صروم

* Matharhane. † Wassaliat. ‡ Massubah. § 18° 18′. ‖ Dorish.
¶ Doshagea. ** Lat. 19° 6′. Dahnak is in 19° 31′. Vid. sup.
†† Maharabi of the map, 20° 14′. ‡‡ Serome, on the coast of Elwon, or *Sarum* island of Horsburgh, 21° 9′. §§ Lat. 21° 30′.

the inferior quadrant shows four inches and a quarter, you go right east four *zâms* towards *Jedda*, if God please. Be it known that in the sea of *Jedda* you find as you find corals in the western seas.

THIRD VOYAGE *from Saîbán (Loheia) to Sawáken**.

The way in which you perform a voyage from *Saibán* to *Sawáken* is the following. From the place where the pole is made with seven inches† you proceed in the same manner, that is to say: first, if the northern gale is strong, you steer E. S. E. and S. E. by E.; if there is but little wind, N. W. by W.; but the true way from *Saibán* to *Sawáken* is by *Jedda*. If the northern wind blows strong you go to *Mokaidah*‡, and with a small breeze to *Hawateb*[1] (the *Hatyas*) or near them. Be it known, that on the sea side of the islands of *Dahlek*[2] is an *amaria* (shoal) and an *ahja*[3], that is to say, *topook*[4] or rocks which are not seen; the most remarkable of them is the *Ahja Tamerkass*[5] on which the water is more or less than three fathoms deep; great precaution is necessary in all these places. If the pole is made by seven inches and a quarter, and the inferior quarter marks seven inches, and the northern wind blows strong, you go to the *Hawateb*, with a small northern breeze to *Harmal* and *Bent Antar*[6], or near it. If the pole is made by seven inches and a half, and if the inferior quadrant shows seven inches less a quarter, and the wind blows strong, you go to *Bent Antar*; with a small northern wind to *Harmal*, or it is seen at the left hand. Be it known, that from *Harmal* to the pole or N. by W. two rhumbs and a half is a shoal *Merai Aari*[7] called *Harbobat*[8], of which great precaution is to be ta ken. Going along the coast and the pole wanting a quarter to eight, and the inferior quadrant showing six inches and a half§, and the wind blowing strong, you turn to *Torbet Khassús*[9] or to the north side of it: if the pole is eight inches and the inferior quadrant shows six inches and a quarter‖, and the northerly wind blows strong, you go to *Batn Hobáb*,[10] with a small northern wind to *Aantab*[11]. If the pole is made by eight inches and a quarter, and the wind blows strong, you go to *Mandel*, and with a small northern breeze to *Jein*[12] or near it. If the pole is made by eight inches and a quarter you go true west

حواطب[1] دهلك[2] احجا[3] طپوق[4] احجاتمرقص[5] بذت عنتر[6]
مراى عاري[7] حربوبت[8] تربت خصوص[9] بطن حباب[10] عنتب[11]
جين[12]

* *Suakin* by Captain ELWON's chart lies in Lat. 19° 4′, Long. 37° 30′.
† Lat. 16° 42′. ‡ Dhalac. § Lat. 17° 54′. ‖ 18° 18.

to *Tahtíát*[1] or it is seen on the right; if the north wind is but weak you go to *Tamarsheh** or *Zúlkafla;* on the left hand at some distance are seen some islands, as *Mosamara* and *Laukâ*[2]†. If the pole wants a quarter to nine inches, and the inferior quadrant shows five and a half, and the north wind blows strong, you go to *Tamarsheh* or *Zúlkafla,* and with a small breeze to *Bár i Músa ssaghír*‡. If from *Bár i Músa ssaghir* you steer true west towards the continent, you go from *Sawákor* or *Bár i Músa Kalír* to *Matiyát*[3]. If the pole is nine inches, and the inferior quadrant shows five inches and a quarter§, and the wind blows strong, you go to *Bárkat*[4] or near it; from *Hind Jodr*[5]‖ true west you go to *Maserkai*[6] ¶; this port is on the upper side of *Sawáken.* If the pole is nine inches and a quarter, and the inferior quadrant shows five inches, you go with a strong wind from *Hind Jodr* to *Sawáken;* with a small breeze to the superior part of *Sawáken:* where is nothing but mountains. Mark that if in these parts you go tacking with a north wind, the rule is to hold the middle between the Arabian and Persian (African) coast, and that if you side to one of them you never attain your object. On the south side the bank *Rás-eshabak*[7]** called *Háwi*[8] is opposite the island *Tamarsheh.* On the north side the end of *Shabak* is opposite *Bár i Músa.*

Fourth Voyage *from Jedda to Aden.*

The way of the voyage from *Jedda* to *Aden* is the following. If you start from *Mesmári* you go two rhumbs†† S. S. W., afterwards two rhumbs S. by W., afterwards two rhumbs to the south pole, turn then and steer S. E. by E. from thence you steer S. E. to *Zokar*‡‡. From *Zokar* you run one rhumb S. by W. afterwards S. S. E. to *Babel Mandam;* from thence one rhumb in the direction E. S. E., then E. by S. to *A'ara*[9], from thence you follow the direction E. by N. to *Adan* in *Yaman,* which is a celebrated port, and is commonly called the *Pearl Aden*[10], though there are no pearls at *Adan;* but as it is a great port, this name arises probably from its trade in pearls; in the same way you call the cocoanuts, which come from Bengal *Kabúlian,* because they come by the way of *Kabúl.* Cornelians of *Yaman* are found at *Aden* in immense quantities.

[1] تحتيات [2] لوكا (Λευκη). [3] مطييات [4] باركت [5] هندجدر [6] مسركاى
[7] راس الشبك [8] هاوي [9] عاره [10] عدن در

* Timershear, 18° 56′. † Dahreat Abged? ‡ Barmosa Segere, 19° 3′.
19° 54′; *Shab Barkoot* is in 19° 14′ ‖ Hindee Geedam, 19° 21′.
¶ Mersa Arakea, on the coast, 20° 13′. ** Ul Shebek, 18° 44′.
†† Perhaps *zams.* ‡‡ Gebel Zoogar, 14° 0′.

Fifth Voyage *from Sawáken to Aden.*

The way *Sawáken* to *Adan* is the following: The voyage may be performed in two different ways. From the 180th day till about the 230th of the *Yazdajerdian* year*, (beginning with the *Naurúz;*) that is to say, from the 45th day till to the 95th day of the *Jelaulian* year, when the sea-faring shuts; the voyage begins from underneath *Shabaka*[1] and you follow the coast till cape *Márát*[2]†; from *Márát* two *záms* true east, then two *záms* E. by S., then two *záms*[3] E. S. E.; from thence turning to S. E. you come to *Saibán;* if from *Saibán* you wish to make *Kamrán,* you go true east, till you see the islands of *Kotáma*[4] and *Okbán*[5]; from thence to *Kamrán* is the *Ssáheb Darke Robbán*[6]? If you sail from *Rakba*‡ one *zaum* towards the south pole you come to the mountain of *Zokar*§, and from thence you proceed in the same manner as it has been mentioned before.

The second way of performing this voyage is with the monsoon which sets in with the 280th day of the *Yazdajerdian* year (12th Aug.) which is the 145th of the *Jelálian,* or near it. Sailing from *Ratka*[7]‖ you steer right east, because in this season the south-western winds prevail. If you do not set out below *Shabaka,* set out from above it, going between the islands and *Shabaka,* till you are passed the sea islands, little *Bár-Músa*¶ and such ones, you follow the course of true east. As soon as the islands disappear you sail S. E. till the pole is marked seven inches and a quarter; you go then S. E. by E. to *Saibán.* This is the course with a favourable wind, but if it is not favourable it is quite different.

Sixth Voyage *from Zailá*** *to Kujurát.*

The way of performing it is the following. After having left *Aibán*[9] and after having passed the unclean places, you steer N.E. by E. till you see the mountains of *Aden;* from thence true east, till you lose sight of the mountains of *Aden;* from thence E. by N. three or four days; then E. N. E. If you do not see the mountains of *Aden* you go N. E. by E. till the pole marks five inches††; from thence in the manner above said. Be it known, that in *Gujerát* grow indigo, ginger, cocoa-nuts, tamarind, and the tree *Tári*[10]‡‡, each bunch of which gives every day a pitcher of wine; there is also the *Pawn*[11], that is to say, *tanbúl*

[1] شبکه [2] مارات [3] زام [4] کتامه [5] عکبان [6] صاحب درکه ربان
[7] رتقه [8] زیلع [9] عیبان [10] تاری [11] پان

* 7th May to 25th June. † Amarat, 18o 19′.
‡ Saddle island. § *Zoogar*, the *zám* must here be taken at one degree.
‖ Trinkatah? 18° 45′; another name for Shabak. ¶ Barmoosa.
** *Zehla*, east of Babelmandal, to Gujerat. †† Lat 13o 30′. ‡‡ The toddy palm.

trees, and a great number of *Túbau* trees *(Tuja)**, from the branches of which the bunches descend as roots; there are bats, the wings of which measure more than a yard; there is also a great number of *Zokúm* trees†, and an infinite number of parrots and apes, so that you might call it the country of apes.

SEVENTH VOYAGE *from Barbara*[1]‡ *to Gujerát.*

If you start from *Khorsaid*[2] you follow the direction N. N. E. till you come to where the measure is equal§, which has been explained in the former chapters, and from thence you proceed in the way above mentioned.

EIGHTH VOYAGE *from Aden to Gujerát.*

If you start from *Aden*, you go true east till you lose sight of the mountains of *Aden;* you continue to hold the same route a day and a night, then E. by N., till the southern wind sets in, then E. N. E. if possible, and if not, you follow the above course and go then E. N. E.; if th ere be little motion with the *Awelama*[3] (?) there is no harm in it; if a closer course is pursued you side to E. by N. and return from thence again to E. N. E., till the measure[4]‖ is equal; in this measure *Lyra*¶ is five inches, or *Sagitta*[5] six inches, or Canopus and Lyra are equal to three inches and a half. Under this measure (height) you see in the sea frequently sea snakes, which ought to be taken care of, as it is a good sign; if you do not see them follow your way in the direction right east till you see them, and then change again your course to E. by N. till you see land. The best rule is to trust to the soundings and not to the sea-snakes, which, if they prove true, show themselves twice and thrice a day. Be it known, that sometimes in the monsoon *Damáni* the ship is thrown by the current towards the Persian shore like mount *Koholád Dabbaghát*[6] *;* at this time the ship finds itself in the barbarian channel; there great precaution is necessary against the whirlpools; besides this place there are such between *Gujerát* and *Sind* in the gulph *Jakad*[7]**, where the wind blows continually from the sea, and the current comes from the shore, so that waves

[1] بربرة [2] خورسعيد [3] اولما [4] مارقياس [5] سهم اول [6] دباغات [7] جكد

* The *Bur* or Banian tree. † Seej or Euphorbia ligularia, ROXBURGH.

‡ Lat. 10o 30′, Long. 45o 10′. § The *kiás* or 16° 54′. ‖ Lat. 16o 54′.

¶ There must be some mistake in these stars, as Lyra would have a meridional altitude of 68o 30′ and Sagitta much more. Canopus also could not be above the horizon along with *Lyra*, as in the given latitude this star only rises after Lyra sets; and it attains an elevation of 19o on the meridian.

** Point *Gigat*, at the entrance of the gulph of *Cutch*.

and contrary currents are not wanting, and a ship falling in with them runs great risk to be lost, if it is not saved by the grace of God; so it is necessary to avoid these places. You must turn from the Persian shore to the Arabian, and steer N. N. E. and N. E. by N. till you are out of reach of this dangerous place, after which you steer again E. N. E. Know that the wind of Canopus (S. S. E.) is not to be trusted till the pole is made with six inches or six inches and a quarter; the flood runs then true E. The signs of a tempest are great distress, and the summer birds called in *Yaman*, *ijám*[1], also the birds *bani safáf*[2] and *amm ul sanání*[3]; these birds keep then to the shore, flying in the summer on the sea; sometimes you see them till where the pole is made with nine inches, (lat. 19° 54′.)

NINTH VOYAGE, *from Kashan*[4]* *to Gujerát.*

If you set sail from *Leiben*[5] you follow the direction E. S. E. and E. by S. during night time, when for the most part the northerly wind ceases. From S. S. E. there is a heavy swell; therefore it is advisable to keep the high sea; if during night time the wind diminishes and you find yourselves at sea, lay to till the wind becomes fresh again; but if it be fair, you go twelve *zám*[6] true east, return then to E. N. E. till *Sagitta* is six inches or *Lyra*[7] five inches, or *Canopus* and *Lyra*† come equally to three inches and a half. If in this height you see really sea-snakes, you follow the course of E. by N. till land is seen. If the sea-snakes are not seen, you steer true east till you see them, and return then to E. by N. The sign of the presence of the sea-snakes are great numbers of birds, as the *Sowaidi*[8] and *koráni*[9]. In some years the sea-snakes and the birds *Sowaidi* are seen on the Arabian coast. If you are leaning towards the Arabian shore, and the pole is made with nine inches or near it‡, it is guessed that you are come near the Indian land; but this is not certain, because these birds do not deserve much credit, as some years they are seen, and in other years they are not seen; sometimes they are to be seen in great numbers, and sometimes but few.

TENTH VOYAGE, *from Khalafát*[10]§ *to Gujerát.*

If you start from *Khalafát* you keep the sea till you come to cape *Fartak*[11]‖, from thence you run twelve *záms* true east, then to E. N. E. or E. by N., as it has been mentioned before.

سلبار[7] زام[6] ليبن[5] قشن[4] ام الصفافي[3] بني سفاف[2] عجام[1]
سويدي[8] كراني[9] خلفات[10] راس فرتك[11]

* Kisseen on south coast of Arabia; Long. 51° 5′.

† Wrong stars, (vide supra) Dr. DORN calls Lyra *ulsa'bak*, not *salbar*.

‡ About 20° N. Lat. § Maculla ? ‖ Cape Fartash, N. E. of Kisseen.

ELEVENTH VOYAGE, *from Zofár* to Gujerát.*

Setting sail from *Zofár* you go S. E. by S. or near it till you get into the open sea, into which cape *Marbát*[1]† stretches out a long way. From thence you go E. N. E. or E. by N. till you come to the *kiás*[2] (Lat. 17°) (the measurement explained in former chapters). At *Zofár* grow also cocoanuts.

TWELFTH VOYAGE, *from Kálhát*[3] *to Gujerát.*

Setting sail from *Kálhát*‡ you follow a true eastern course till you see the sea-snakes, and if you see them, you return towards the coast, till *Lyra*[4] is marked by four inches and a half; from thence you steer true east till you come to the shore; this is the course performed with the monsoon *Azíb:* but at the time of other monsoons you follow the direction E. by S. till you are come to the *kiás* (measurement explained in the former chapters), from thence true east till to the end.

THIRTEENTH VOYAGE, *from Maskát to Gujerát.*

If from these ports you wish to make *Concan*[5], you follow the direction of E. by S. and east; if you wish to go to *Monembár*§, you follow the direction S. E. by E., you come then to the mount *Karata*[6], which is a famous mountain of *Monembár.*

FOURTEENTH VOYAGE, *from Aden to Monembár*[7], *(Malabar.)*

The course is the same which has been already mentioned before from *Aden* to *Gujerát;* you go on till the pole marks six inches and a half or seven inches‖; if from thence you can go tacking, you go in the direction of E. by S. or true east; if it is impossible to keep this course, your way is E. by N. till the pole is made by seven inches and half or eight inches; from thence you follow the direction E. by S. till the pole is made with six inches¶, then true east till land is in sight, which is *A'zádíw*[8]** or a place near it; you steer then towards the shore; what is meant by the inches, *assabá*[9], and the pole or polar star *jah*[10] has been explained in the former chapters.

FIFTEENTH VOYAGE, *from Aden to Hormúz, (Ormus.)*

Sailing from *Aden* in the direction true east you see the mountains of *Aden,* and if you do not see them you steer in the direction of *Dairai Bar*[11] which is E. N. E. till *Fartak*[12], from thence five *záms*[13]††

راس مربات[1] قباى[2] قلهات[3] سلبار[4] كنكن[5] قرطه[6] مونيبار[7]

ازادیو[8] اصبع[9] جاه[10] ديرهٔ بر[11] فرتك[12] زام[13]

* Dofar, a little further east of Fartak. † Cape Morebat; Lat. 16° 50′, Long. 55°. ‡ Half way between Muscat and Cape Rasalgat. § Malabar. ‖ About Lat. 17°. ¶ Lat. 15°. ** Ajideeva near Ankola, lat. 14° 40′.

†† The *zám* here must be about 35 miles.

N. E. by E.; then N. E. to *Marbáth*[1] and *Mottúka*[2], (this last is called *Janjari*[3],) from thence you follow again the direction N. E. by E. taking care on your way of the island *Hausakeya*[4]*, because on its sea-shore is a shallow; it is necessary to come forth between *Súkara*[5] and the islands *Khúr*[6] or *Múria*[7]†. After having found *Súkara* you sail five *záms* N. E. by E. then three *záms* N. E., from thence five N. E. by N. to *Mousír*[8]‡ you may see it or not; if you see it, you follow the same way till the island is left behind: from thence four *záms* to N. N. E. from whence you return to N. by E. till *Rasolhadd*[9]; from *Rasolhadd* you direct yourselves to the known *Dairai Barr*[10] till *Rás Mosandem*[11]§, from thence to the pole to *Hormúz*. The pearls for which *Hormúz* is famous are fished on the islands of *Kais*[12]‖ and *Bahrain*[13]. If you wish to go from *Rasolhadd* to *Dúlsind*[14]¶ you steer E. N. E. till you come to *Pasani*[15] or near it; from thence to *Dairai Barr*[16], that is to say, E. by S. till *Rás Karáshi*[17]**, where you come to an anchor, waiting for the fishing boats with which you enter the port. The ancient pilots used to sail from Cape *Alhadd* to that of *Karáshi* in the direction E. by N. but it is better to go with the higher wind.

SIXTEENTH VOYAGE, *from Diu to Meshkáss*[18]††.

The time for this voyage is from the tenth day after the *Yazdajerdian Nawrúz* to the 60th day (7th Nov.—27th Dec.) which is to say, from the 240th day after the *Jelalian Nawrúz* to the 290th. First you follow the direction W. by S. two *Terfa*[19], that is to say, two inches, which make the poles eight inches‡‡; from thence to W. S. W. one *Terfa;* if it is the time to measure the pole (to take the height by the polar star) you take it: if it not be the time for it§§ you take the height at the setting of *Aquila*[20]‖‖ by the *Lyra*[21] which gives

[1] مرباط [2] مطوقه [3] جنجري [4] حاسكيته [5] سوقره [6] خور [7] موريا
[8] مصير [9] راس الحد [10] ديرهٔ بر [11] راس مسندم [12] قيس
[13] بحرين [14] ديول سند [15] پسني [16] ديرهٔ بر [17] راس كراسي
[18] مشقاص [19] ترفه [20] نسرواقع [21] سلباري

* Hasek of maps. † Curia Muria. ‡ Mazeira island.
§ Cape Mussendan, at the entrance of the Persian Gulph. ‖ Kishma?
¶ Mouths of Indus. ** Kurachee on the northernmost mouth.
†† Maculla? or a place nearer Morebat? ‡‡ Lat. 18o 18'.
§§ This sentence proves that the meridional passage of Polaris was usually observed.
‖‖ The Arabic name of the star here translated *Aquila* by the Baron enables us to clear up the difficulty in former passages. In the description of the Arabic celestial globe by Dr. DORN (Roy. As. Soc. Trans. II. 381, the star النسر الواقع (the falling vulture) is shown to be *alpha lyræ*, or wega of the Alphonsine tables. The translation in the text, therefore, should be—" take the height of Polaris at the setting of *wega* (in lyra), i. e. of alpha lyræ.

seven inches and a half, then you steer true east to *Sájer*[1]*, the mountains of *Dain*[2]† are visible on the right; at this time of the year it is better to see them than to see *Fartak*, because the wind coming from N. N. E. is to be feared, which at this time of the year (it being winter) is much to be feared, as it raises great dust and waves. If you cannot attain *Sájer* you pass *Meshkáss;* if the polar star is seven inches and the ship at sea with a strong wind, turn again its head to the sea one or two days, according to the strength or the weakness of the wind; after the winterly wind sets in the monsoon *Azib*, and in this case you go back as much as you are come. If you start from *Diu* on the 70th or 80th day of the *Yazdajerdian* year (6th —16th Jan.) your way lies then in the direction W. S. W. till you come opposite the Cape of *Fartak*, which is the 300th day from the *Jelalian Nawrúz* or the 310th. From opposite the cape *Fartak* you go true east; if the winterly wind blows, you haul down the sails and lay to, if possible; if not, you go with as little sail as possible to get the ship free of the waves. After the ceasing of the winterly wind the monsoon *Azib* sets in, in which case you measure back your steps as much as you have gone, and this season is better than the former. Some years the winterly winds blow till to the hundredth day of the *Yazdajerdian* year, which is the 330th day of the *Jelalian* (14th Feb.) particularly from *Fartak* to *Zofár;* the signs of land being near are the birds *Dhofaik*[3] and *Koraik*[4], and of the sea beasts or fishes; the *Tabbáka*[5] and *Lezák*[6], and of the maritime plants the *Kirmith*[7], and *Kelhaf*[8].

SEVENTEENTH VOYAGE, *from Diu to Shehr and Aden.*

The course lies first W. S. W. till opposite *Fartak*, from thence true east till land is in sight; this voyage is performed within the tenth day of the *Yazdajerdian* year, and the sixtieth, that is to say, within the 240th and 290th of the *Jelalian* (7th Nov.—27th Dec.) if it is performed within the 80th or 90th day of the *Yazdajerdian* year, answering to the 310th or 320th of the *Jelalian* (16th Jan.—26th Jan.) the course to be held is W. S. W. till the pole is six inches and a quarter or six inches, then true west. If you set out from *Diu* on the 110th day of the *Yazdajerdian* year, which answers to the 340th day of the *Jelalian* year (15th Feb.), the course to *Meshkass* and *Shehr* is W. S. W. and S. W. by W. till the pole is marked by five inches and a quarter; from thence you run true west; at your right the island of *Socotra* is near in sight; as soon as you

[1] ساجر [2] جبال‌الدين [3] ضفيك [4] كريك [5] طباقه [6] لزاق [7] قرمط [8] قلحف

* Seger. † *Doan* near *Fartak.*

see it, if you are bound to *Meshkass* or *Hírídji*[1]* you steer N. W. by W. and if you intend to go to *Shehr* you steer W. N. W. till you see land; the sign of your approaching *Socotra* is that you see of the sea-plants or an infinite number of trees of the species called *Kirmith*, but sometimes you see them and sometimes not; on the coast of *Shehr* men and animals live all on fish.

Eighteenth Voyage, *from Mahâim*[2]† *and Shíúl*[3] *to the Arabic coast.*

The time for sailing from these ports is from the tenth to the sixteenth day of the *Yazdajerdian* year, which answers from the 240th to the 290th day of the *Jelalian* year; the course to be followed is W. by S. till the pole is marked by seven inches, from thence you steer true west. If you intend to go to *Meshkass*, *Shehr*, and *Aden*, the course to be followed is W. by S., till you come opposite to *Fartak*, from thence you go true west to *Fartak*, and from thence to which port you please: if you set out from the above mentioned ports at the end of the season, the direction to be followed is W. S. W. till the pole is four inches and a quarter or four inches and an eighth, from thence you steer true west to *Kardafún*[4]‡. The ports *Mahâim* and *Shíúl* belong to *Deccan;* from this country come the muslins called *Candaharians*, and those of *Daulatabád*, *Berúpátari*[5], and *Bairami*[6].

Nineteenth Voyage, *from Diu to the islands of Díb*[7], *(Maldives.)*

Steer first S. S. E. the pole being made by five inches, side towards the land in the direction of E. S. E. and S. E. by E. till you see the mountains of *Monibár;* from thence to *Daira Barra*, till the pole is three inches; from thence to the south pole, till the *faráqad*[8]§ are eight inches and a quarter, then true W. to the island *Foyúka*[9], and the islands near it.

Twentieth Voyage, *from Daubúl*[10] *to the islands of Díb.*

You follow first the direction W. S. W. till you lose the shore, from thence to *Daira* S. W. by W. till land is in sight; from thence S. S. E. till the pole comes to three inches, from thence to the south pole and S. S. W. till the *Farkadain* (β and γ in the little bear) are marked by eight inches and a half; from thence true west to *Foyúka* or its neighbourhood. Mark what has been said above: till land is in sight steering S. W. by W., that means, that the land is at hand.

[1] حيريج [2] مهايم [3] شيول [4] كردفون [5] بروپاتري [6] بيرمي [7] بزرالذيب
[8] فراقد [9] فيوكه [10] دابول

* *Maculla?* and *Hargiah* near *Aden*. † *Mahim*, north, and *Sheoúl*, south of Bombay. ‡ *Guardafui*, N. E. Cape of Africa, lat. 12°.

§ The *far kadain*, or β and γ ursæ minoris.

Be it known to you that in some of the islands of the Maldives the inhabitants hunt with dogs, bred to the purpose, the Orang-ootang *(Nísnaus)* and eat it. The *Nísnaus* is an animal resembling a monkey, but endowed with speech; but generally monkeys are also called *Nísnaus*. I have heard from the brother of *Janúm Hamza*, the late Intendant of Egypt, that coming one day on commercial business at the extremity of *Yaman*, to a walled village, he alighted at a house where two boys lying on the ground were crying, and that out of commiseration he untied their fetters. The master of the house, returning, laughed at it, and said, these are *Nísnaus*, which we hunt. The next day the master of the house took his disbelieving guest with him, and he saw the *Nísnaus* hunted by dogs. Some *Nísnaus* emerge from the sea, their flesh is a great dainty; that they are endowed with the power of speech is even recorded in the books of philosophers.

TWENTY-FIRST VOYAGE, *from Diú to Maskát and Hormúz.*

The time of performing this voyage is from the 10th of the *Yazdajerdian* year to the 60th, (7th Nov.—27th Dec.) that is to say, from the 242nd day of the *Jelalian* year to the 290th; but you must continually go tacking, because the wind which is at this time of the year the monsoon *Azíb*, blows very strong; if it is impossible to pursue your course tacking, you must wait till the wind grows favourable, in which case you go till the Lyra[1] (?) is made by three inches and a half, and the land is at hand; because the interior pole is near the Arabian mountains; from thence you proceed true west to *Saatarí*[2]*, or its neighbourhood. If you set out on the 110th day of the *Yazdajerdian* year, which is the 340th of the *Jelalian* year, (7th Feb.) your way is W. N. W. till the pole is eleven inches; from thence true west till to *Tíb*[3], or its neighbourhood; but if you set out on the 150th or 160th day from the *Yazdajerdian Nawrúz*, which is the 15th or 25th of the *Jelalian* year (26th March), then you proceed W. S. W. and S. W. by W. till you see the island of *Socotra:* direct your course then towards the north pole till *Hausakia*†, from thence to *Daira* (E. N. E.) towards the Arabian coast; if the wind grows strong before *Socotra* is in sight, the western wind *Kús* you proceed tacking to N. W. by N. or N. W. or N. N. W. as you can till you see *Mottuk*[4], *Khúr*[5], or *Múria*[6]‡. If these places are not seen, you must take care of *Ghabbai-tín*[7]§. In order to avoid it, you put the head of the ship to the sea and go on. The sign that you

[1] سلبار [2] سعتري [3] طيب [4] مطوق [5] خور [6] موريا [7] غبه‌تين

* *Swardi*, near Muscat. † Hasek. ‡ Curia Muria. § Cape Isolette?

are near *Ghebba* is, that the water grows yellow; as soon as you see signs of land being near you must be in guard against it, till *Madreka*[1] or *Massíra*[2]*. If the pole is ten inches and a half, and land is not in sight, and no signs are seen; you have passed the Arabian shore, and then you have no chance but to steer for the Indian continent. You follow the direction E. by S. till the pole is ten inches to *Mangalor*† or *Soománát*‡ or *Shúrowaur*[3] and *Gúlinaur*[4]; but take care not to bring the pole to ten inches and a half, (22° 18′) in which case you necessarily come to *Jaked*[5]§ which is your damage and repentance too late. God be your guide! What is said of Indian whirlpools is all a tale, except the whirlpools in the gulph of *Jaked*, and in the Barbarian channel near *Kardafún*, where ships falling in are unavoidably lost; the causes of it are the heavy waves, the strong winds, the currents and the breakers of the coast, so that it is impossible for the ship either to hold the sea or to land on the shore, if God does not grant his particular grace. If you guess that you may be drifting to *Jaked* you must take before hand your precautions and endeavour to reach from the coast of *Makrán* either the port of *Kalmata*[6] or *Kawáder*[7], or *Kapchi Makrán*[8]; *Bandar Kawauder*||, is the place where cocoanuts grow; or you must try to go to *Karaushi*¶ or to enter *Khárdiúl Sind*[9]; that is to say, the port of *Lahore*, to get rid of the fear of *Jaked*. In Sind are a great number of liver-eaters, against whom you must be on your care; because if they meet a man who eats his dinner in public, they have the talent of eating up his liver with their eyes, and so kill him. This is not to be slighted.

TWENTY-SECOND VOYAGE, *from Cambeya to Aden at the end of the season.*

Cambeya is the district in the province of *Gujerát*, comprehending the ports of *Ahmedabad* ano *Patan*; from thence comes the cotton of *Patan*; and *Baháder* and some Indian stuffs. In this country is a profusion of *Babaghúri*[10] and cornelians: but the best of the last are those coming from Yaman. If you set out from *Cambeya* and come to *Diú* or its district, you must sail at night, because at the end of the season the wind blows from the west during the day, but during the night from the shore; with this land breeze you go as far you can towards the south. In some years the wind is a strong north western in the place of the *Maurara* (sea-snakes), then your course is

[1] مدركه [2] مصيره [3] شوروار [4] كولي نار [5] چكد [6] كلمته [7] كوادر
[8] كپچي مكران [9] خوردپول [10] باباغواري

* Mazeira. † Mungrole, 21° 30′.
‡ Somnáth, Choorwaur, and Cooleynorky Pagoda.
§ Point Gigat, or Juggut, at the south-west corner of the Gulf of Kutch.
|| One of the three Bunders on the coast of Gujerát. ¶ Korachee.

S. W. by W. Your measure (height) be the pole and no other, till the pole marks five inches, then you go W. S. W. till the pole is four inches and a quarter or four inches and an eighth, then true west to *Kardafún*. The signs of *Kardafún* being near are the birds *Karík*[1] and *Manji*[2], but few are seen of the last, those which are the most frequent are the *Daghát*[3] and *Kaslá*[4]; of sea animals you see the *Tábbáka*[5] (tortoise?) and sometimes the sea-horse; as soon as land is again at a distance these signs vanish: it is also probable that the birds here seen are those of Socotra, *Samaha*[6] and *Dorzán*[7]. God knows the rest. If at this time of your course *Socotra* is on the north, you direct yourselves to *Hadiai Socotra*[8], and if you go to *Kardafún*, your course is along the *Persian** continent. If you go from *Hejrát*[9]† to *Dárzin*[10] you steer W. N. W. and if you wish to go from *Mít*[11]‡ to *Aden* you steer true west till *Aden* is in sight, then you follow the current, *májri*[12], till *Báb Mándam*.

TWENTY-THIRD VOYAGE, *from Dábúl*§ *to Aden*[13].

If you leave *Dábúl* at the end of the season, you direct yourselves W. S. W. till the pole is four inches and an eighth, from thence true west to *Kardafún*.

TWENTY-FOURTH VOYAGE, *from Kúwwai Sindabúr*[14]†† *to Aden*.

If you start from *Kúwwai Sindabúr* at the end of the season, take care not to fall on Cape *Fál*[15], because it is five inches and a quarter on the pole; steer therefore W. by S. till the pole is four inches and an eighth, from thence true west.

TWENTY-FIFTH VOYAGE, *from Hennúr*[16]‖ *and Báudaklaw*[17]¶ *to Aden*.

If you leave those two ports at the end of the season, go from *Azádiá*[18]** or *Angúli*[19] side-wards, and then turn to the sea true west, if the wind be favourable; if not, direct yourselves W. by S. or W. by N. your utmost being S. W. by W. If you cannot attain any of these directions, turn and steer to the pole till the wind grows favourable, then turn again and steer W. by S. till the pole is made by four inches and an eighth, so you come then going true west to *Kardafún:* the vicinity of Cape *Fawl* is known by the quantity of birds and a

[1] كريك [2] منجي [3] داغات [4] كسلان [5] طباقه [6] سمحا [7] درزان
[8] هديه‌سقطره [9] هجرات [10] دارزين [11] مبط [12] مجري [13] دابول
[14] كوه‌سند اپور [15] راس‌الفال [16] هنوز [17] بادقلا [18] ازاديو [19] انگولي

* African. † Harjieh? ‡ Mette, west of Guardafui.
§ South of Bombay, lat. 17° 45′. ‖ Honawer on Malabar coast, 14° 15′ lat.
¶ Bhatakulí or Betkuldrúg, ditto, 14°. ** Aujídeeva, off Ankola, lat. 18°.
†† Probably *Cotuale Sonderbaut* of Arrowsmith, north of Goa.

great quantity of *Kálháf*[1] that is to say, *sea foam* and *Kermet*[2], or sea trees.

TWENTY-SIXTH VOYAGE, *from Calicút to Kardafún.*

If you sail from *Calicút* with a favourable wind, steer W. by S. and sometimes W. S. W. so you come to the island *Kolfaini*[3]* ; if at this time, that is to say, on the 140th day of the *Yazdajerdian* year, which is the 5th of the *Jelalian* (March), the sea shuts, the flood runs at this time N. N. W. from thence you direct your course to the south pole, and go tacking if the flood runs to the south pole, but if the wind falls lower, then this course to S. W., S. W. by S. and S. S. W. you may follow it a day and a night without inconvenience. If it should fall yet lower, turn and steer to the north pole or near it, particularly if the pole is made by less than three inches (lat. 10°), because it is profitable to be then high north, and the wind grows favourable ; if it be already so, you run from *Calicút* till *Kolfaini* two *záms* in the direction of W. by S., then eight or nine *záms* W. S. W.† then you may rejoice, as you have got clear of the islands of *Fúl*, from thence W. by N. and W. N. W. till the pole is four inches and a quarter, and then true west to *Kardafún*. *Calicút* is famous for its pepper plantations : its Prince is the *Sáumerú*‡ who is at war with the Portuguese. On these coasts are a great number of elephants employed in dragging ships, launching them into the sea, and similar doings.

TWENTY-SEVENTH VOYAGE, *from Diú to Malacca.*

Leaving *Diú* you go first S. S. E. till the pole is five inches, and side then towards the land, till the distance between it and between the ship is six *záms ;* from thence you steer S. S. E., because in the neighbourhood of Ceylon, the sea runs high, the further you keep off the more quiet the sea grows ; you must not side all at once but by degrees, first till the *farkadain* (β and γ in the little bear) are made by a quarter less than eight inches, from thence to S. E. till the *farkadain* are seven inches and a quarter, from thence true east at a rate of 18 záms, then you have passed Ceylon. The sign of Ceylon being near is continual lightning, be it accompanied by rain or without rain; so that the lightning, of Ceylon is grown proverbial for a liar. After having passed Ceylon you go E. N. E. and E. by N. till the pole is made by two inches, from thence true E. till to the island of *Sarjal*[4] which is one of the *Nájbári* (Nicobarian) islands. After having left it behind you steer E. by S. till land is in sight, you go along it to the islands *Falúsanbílen*[5]§ which are nine islands ; from thence to

[1] قلحف [2] قرمط [3] كلفيني [4] سرجل [5] فلوسنبيلن

* Calpeni, one of the Laccadives.
† This course is the "nine degree channel" through the Laccadives.
‡ SHAH AMIR? of the Bider or Ahmedabad dynasty, A. D. 1505—49.
§ Pulo Sambelan or the "nine islands" on the Malay coast, lat 4° 5'.

the south pole. At your right some islands are seen at a distance, so you go towards the south pole till you come to the islands to *Folodjomra*[1]* which appear near, from thence E. S. E. where the sea is more than ten fathoms, if it be 11 or 12 never mind, because after 12 is the deep sea, and you are clear of the *Shob Kafaussi.* You go till mount *Folúpásalár*[2], is opposite, N. E. till the soundings give 24 fathoms, because there is a bent *sháb*[3] running out in the sea, which is to be taken care of—wherefore your course must be followed always in a depth of 24 fathoms till you see the mount *Folúpásalár* N. N. E.; then you steer towards the land and *Dairai-barra* (E.N.E.) till Malacca. The inhabitants of *Shuli*[4]† (?)go from *Falúsanbílen* two záms to the south pole.

TWENTY-EIGHTH VOYAGE, *from Diú to Shátijám*[5]‡, *i. e. to Bengal.*

Sailing from *Diú,* your course, till you have left Ceylon behind you, is the same as the above mentioned, then you steer N. E. Ceylon remaining on the western side; then N. E. by N. till you come opposite to *Rakanj*[6]§, where the pole is made with a quarter wanting to nine, and the *Aselli* scarce with six inches; if in this course you see land it is well; if not, steer E. N. E. till the pole is nine inches and a half, so you come to the island of *Dardiw*[7]. If you see it at this time it is well, if not go right east till you see land, but take care of *Fesht Hayumiún*[8]‖, which is a desert rock, round which the water is twenty fathoms deep; take care also of *Dardiw*¶ where the water is but five fathoms. If *Rakanj* is in sight, go N. N. W. with 25 fathoms of water. At this time *Hayumiún* remains on your right, of which great care is to be taken. After having passed it you approach the land till your soundings give 16 fathoms, and with this course you come to *Dardiw;* after having left it behind you go with 12 fathoms depth N. N. W., there you come to a great *Khúr*[9] (?) called *Bákál*[10]**, and then five capes which are taken for islands by those who don't know them; then comes a *Ghobba*[11], that is to say, a gulpf full of shallows, shoals and breakers; this place is called *Kákar Diwá*[12]††, then you come to the island *Zenjilia*[13]‡‡ which is facing

ركنج[6] شاطي جام[5] طايفه شوليان[4] شعب[3] فلوپاسلار[2] فلوجمره[1]

رنجليا[13] كوكرن يرا[12] غبه[11] باكال[10] خور[9] فشت هيومميون[8] دردبو[7]

* The Arroas islands. Mt. *Parcelar* is a well known land mark on the coast, lat. 2° 50′. † The Sholas or Marhatta traders? ‡ Chittagong, once a place of great trade. § Arrakan, lat. 20° 10′.

‖ Probably Oyster island, a barren rock off Arracan, or St. Martin's reef.

¶ Probably *Nardiel* or Narkol deap of Horsburgh, off the *Tek Naaf* entrance.

** Probably *Mascall* island. †† Cutub-deep, southof Chittagong.

‡‡ There are now no islands seaward of the Chittagong coast to which the sailing directions of SIDI will apply: but Lieut. LLOYD, of the Indian Navy, who has surveyed this line, informs us that there is a long shoal called "the patch," parallel with the coast, which is nearly dry at low water, and may have formed the islands of Zenjilia three centuries ago; for there have evidently been great changes in these parts, even in the memory of our own navigators.

you, your way lies N. N. W. When you approach this island, side to the sea, because its southern cape is *rikk*[1], that is to say, a shallow, and the colour of the water grows white; meanwhile, on the sea side it is seen green. Hold that course, and you'll find better soundings by degrees till you come to 17 and 18 fathoms. Coming to this place you find the water again whitish, these shallows are on the south side of *Fesht Gúrián*, which is a desert place: here the sea is noisy, don't keep either too near to the island of *Zenjilia*, nor too far from it, but steer a middle course; if the soundings give 18 fathoms or near it, you have passed *Zenjilia;* then you go in the direction of the north pole, and continue to take soundings till you come to seven fathoms; from thence you steer in the direction of the north pole, and to the rising place of the β and γ of the little bear, till your soundings are six fathoms but not less. So you come to cape *Khúr** which is *Shátijám*. Here you stop till the *rebbán*[2] (tide) come, with which you enter the port. Bengal is abundant in ivory and ebony; the finest muslin turbans, the very best *jutár*[3]†, and most precious Indian stuffs come from thence; the finest muslin sashes are called *malmal*[4], and the most precious of them *malmali-sháhí*, which by confusion is generally named *marmare-sháhí* (royal marble); there are also sea-bulls[5], the best of them are found between Bengal and Delhi in the interior lake; they are called *sea bulls*, although they don't live in the sea, but in the interior lakes on the land; but the merchants call them so; for in the interior northern lakes, in the mountains of the Afgháns, are also found the rhinoceros (*Karkadán*[6], the name quite the same as the *Krokotos* of Ctesias), but their horns are but two palms long; it is related that those which are found in Abyssinia have much longer horns. Girafes are found but in Abyssinia and never in India.

TWENTY-NINTH VOYAGE, *from Malacca to Aden.*

Starting from Malacca you go first along the coast till to the mountain *Folúpásalár*[7]; there you take care of the above-mentioned bank[8]. This mountain is seen in the direction E. by S., and on some distance you see *Folúdjomar*[9]; after having left it behind you your direction is that of the north pole till you come to the islands *Falúsanbílen*‡, from thence you steer for some time N. N. W. till you come to the islands *Firak*[10]§ and *Yaflúbotof*[11]‖, from thence W. by N. till to the island *Nájbán*[12], from thence W. by S. till the *farkadain* (β

[1] رق [2] زبان [3] جرتار [4] ململ [5] كاوقطاس [6] كركدان [7] فلوپاسلار
[8] شعب [9] فلوجمر [10] فيرك [11] يافلوبتف [12] ناجبان (Nicobars)

* The word *Khúr* used here and elsewhere seems a corruption of the Bengáli term *khál*, creek or estuary.

† *Choutar*, a fine cloth, so called from its four threads.

‡ Pulo Sambelan of the Straits.

§ Probably *Pera* on the Malay peninsula, or Penang?

‖ Pulo Bouton.

and γ of the little bear) are made with a quarter less eight; from thence true west, Ceylon being in sight at the right; if you don't see it, continue nevertheless your western course till to the Maldives, and from thence to W. N. W. siding a little to N. W. by W. till opposite *Kardafún*, and till the pole is made by four inches and an eighth, from thence true west till you reach the land.

THIRTIETH VOYAGE, *from Shátijám, (Chittagong,) that is to say, from Bengal to the Arabian coast.*

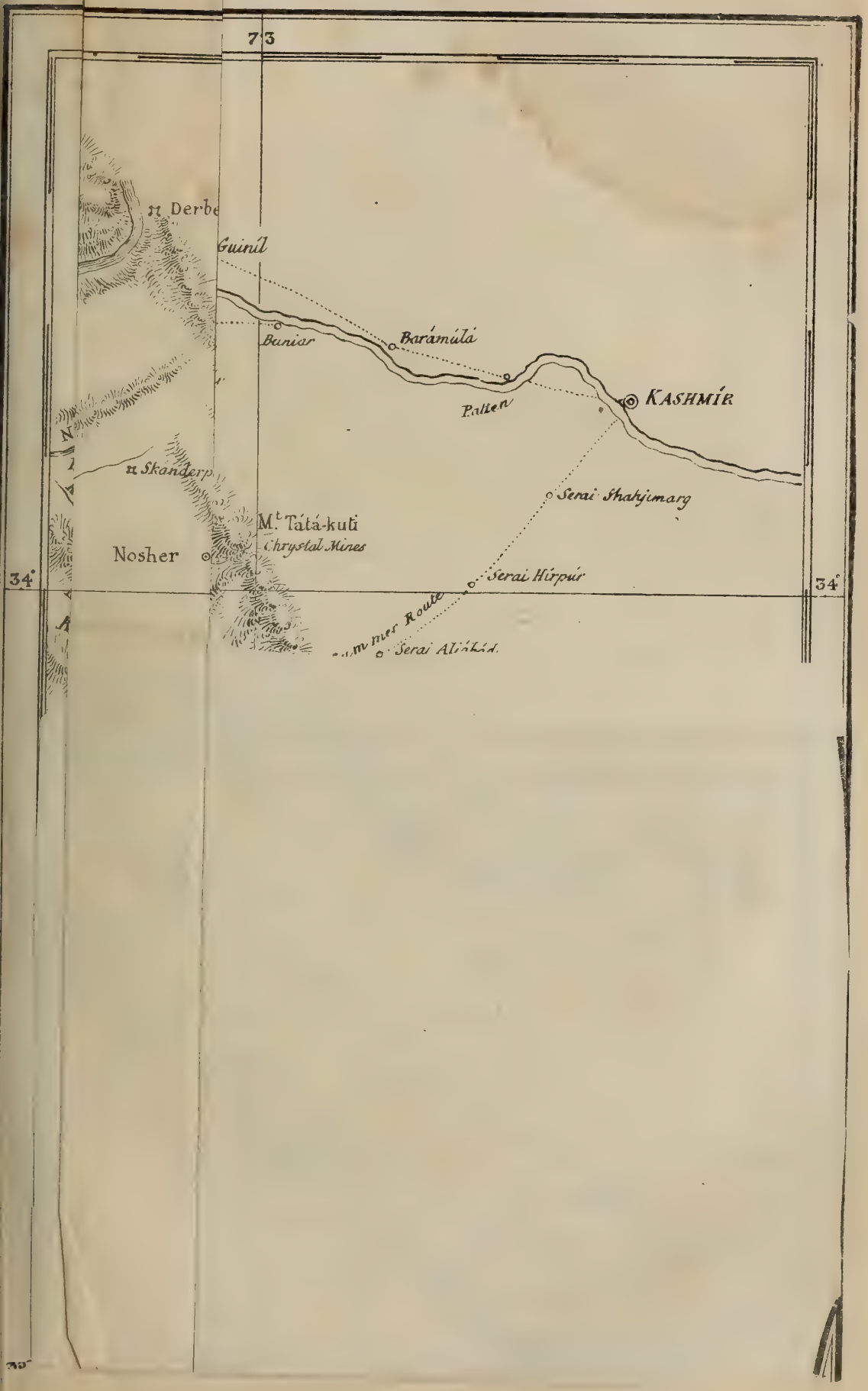
Sail at the end of the *madd* (flood), that is to say, when three quarters of it are passed, and go then with the ebb W. by S. two záms, the soundings being six, seven and eight fathoms; weigh the anchor as soon as the flood sets in and go to the wind, weak or strong, till the ebb begins again one zám W. S. W. then two záms N. W. The water grows then black, and you direct yourselves S. S. W. till the *Farkadain* are made with eight inches less a quarter, from thence true W. Ceylon being in sight on your right, you continue true W. till to the Maldives, and from thence to *Kardafún* in the way above mentioned. The measure of the stars (the taking of the height) and the distance of the inches has been explained already.

II.—*Extracts translated from a Memoir on a Map of Peshâwar and the country comprised between the Indus and the Hydaspes, the Peucelaotis and Taxila of ancient geography, by* M. A. COURT, *in the service of Mahá-rája Ranjít Singh.*

I.—ON THE PROVINCE OF TAXILA.

The space lying between the Indus and Hydaspes was first known to the Greeks under the name of *Taxila:* whether as its ancient local title, or one given by the soldiers of ALEXANDER from the town of the same name, afterwards its capital, is uncertain*. STRABO says that the

* Col. WILFORD identifies the *town* of Taxila with the *Tacsha-sila* of Hindu ancient geography, of which the extensive ruins were supposed by ELPHINSTONE to be traced at Manikyala. The *Tacsha Sáila* or *Syála* tribe are still numerous in the Panjáb. They state, the former name of their city to have been *Uda-nágari*. (As. Res. VIII. 42.) There is deposited in the Asiatic Society's collection a large manuscript map of the Panjáb compiled by Col. (then *Lieut.)* WILFORD from the route and compass surveys of a native, MIRZA MOGUL BEG, expressly instructed by himself and employed from 1786 to 1796, in travelling and collecting materials to illustrate an account of ALEXANDER'S progress; the account however does not seem ever to have seen the light, and it is probable that the map has thus suffered oblivion. It is considerably fuller than M. COURT'S Sketch, and as might be expected from the Compiler's learning, more correct in the orthography of names. We regret not having collated the two before lithographing M. COURT'S map.—ED.


73
Derbe
Guinúl
Baniar
Baramúlá
KASHMÍR
Palten
Skanderp
Serai Shahjimarg
M.t Tátá-kuti
Chrystal Mines
Nosher
34°
Serai Hirpúr
Summer Route
Serai Alishid.
34°

ROUTE MAP

of the Provinces comprising

the ancient **TAXILA** and **PEUCELAOTIS**

in the Panjáb

made from Compass bearings and stages

by A COURT *ancien Elève de l'Ecole militaire de Saint-Cyr*

In 1826-1835

J. H. Tassin's Lith. Press, Calcutta.

native kings assumed the name on mounting the throne; and we find in history ALEXANDER obliging OMPHIS, who governed the country, to take the name of TAXILES. The appellation is quite unknown at the present day.

It appears that the Greeks confined Taxila proper to the central part of the region between the Indus and the Hydaspes; for when they passed it, the northern portion was ruled by chiefs independent of OMPHIS, while the south was in open opposition to both ALEXANDER and his ally.

The geographical limits of Taxila are well defined on the map, by the two rivers and the chain of *Pirpanjál* on the north;—from this range to *Koshâb* on the south it measures 120 kos, with a breadth from *Attok* to the *Jelim* of 74 kos*.

It seems probable that the original inhabitants were Hindus of the *Pandava* race, and *Chandra-vansís*. With these were amalgamated Persians, Scythians, and even Greeks; for the *Ghékers*, of whom so much has lately been written, I take to be the descendants of the Macedonian colonists;—they themselves trace their ancestors to the *Khaiani* race of Persia, but the word seems but a corruption of *Greek*.

Taxila contains the traces of a number of ancient towns of which the origin is now unknown. Massive walls of stone masonry are seen, and in some places brick work of Babylonish dimensions. The inhabitants call them the ruins of temples of *Deva Nagari*† or *Sita-Ráma*. The most curious, however, are the mausolea, cupolas, or topes. In the northern provinces are found colossal statues of plaster, marble, and stone, most of which have been mutilated by the bigotry of the Muhammedans. Smaller idols are also occasionally dug up of superior execution: some I have remarked with frizzled hair. The ancient religion of the country was Buddhistic. The worship of Bacchus, or the Sun, prevailed at the time of ALEXANDER, and traces of it are visible in the names of towns, as *Surya*, *Sita*, and *Causalya*; the sun, his daughter and mother (?)"

The present inhabitants, being of so mixed an origin, betray striking varieties of character and manners. The Musulmans who border the Hydaspes resemble perfectly the Hindus of the *Panjáb*,—while those on the east bank of the Indus have all the peculiarities of the Afgháns, whence they are descended—an elegant figure, pleasing features, and vivacity of expression. They are loquacious like the Persians:—and though living in servitude, they retain their national pride, and submit

* Col. WILFORD's map states that the *kos* of this part of the country varies from 10 to 22 furlongs, probably 2 miles will be a fair average.—ED.

† Doubtless the *Uda-nágari* of WILFORD; see note to page 468.—ED.

only to the authority of their chiefs, with whom they live on terms of equality. "I have everywhere witnessed their courage and intrepidity, in their encounters with the Sikhs, on whose bayonets they rush sword in hand. Against the Hindus a fierce and implacable bigotry is kept up among them by their *Mullas*, whom they regard with superstitious reverence. They retain many traits of hospitality: are blunt, coarse in manner, and devoid of the polish of the Persians. Their dress is a long shirt, blue turban and scarf, which serves the secondary purpose of a cloth to pray upon. Their women are allowed comparatively much liberty, but do not abuse it: they perform as usual the whole labour of the household, while the men are in the fields. Their houses are constructed of mud roofed with timber, and again covered with earth to keep off the rain. The tribes of the plains, having a fine fertile land, are in good circumstances; but those of the *Putwár*, *Thenni*, and *Khibbi* districts are sadly oppressed by the Sikhs. The mountain tribes along the west bank of the Hydaspes are in a half savage state. Most of them live only by plunder and robbery, and think as little of cutting a man's throat as a sheep's. Travelling alone amongst them is most hazardous.

"The language of Taxila proper is the Hindustaní corrupted, which pervades the Panjáb: in the north, *Cashmerian;* and on the Indus the *Pashtú* dialect, peculiar to the Afghán tribes. The Persian is little used, except among the informed classes.

"The principal towns in the southern division are *Rawel Pindi*, *Jèlam*, *Pind-dádan Khán*, *Nillé*, *Fatehganj*, *Khibbi*, and *Makhade*:—in the central division, *Attok*, *Khampur*, *Iskanderpur* and *Noachir*:—in the northern, *Muzafferábád*, *Birrh*, *Pakkheli*, and *Kaka Bamba*."

M. Court describes minutely the whole of these and other remarkable places, repeating under the head of *Manikyála* the account of his interesting operations upon the *topes* there, which was published in the Journal for 1834. We have lithographed his sketch of the principal tope opened by M. Ventura and his ground-plan of the place (Plate XXVI.) to shew the situation of the numerous ruins with which it is studded, and which he considers to be the sepulchres of ancient kings. The following explanation refers to the figures on the plate:—

1. Chief Cupola explored by General Ventura, (J. A. S. 1834.)
2. Cupola whence were obtained the coins and relics described by M. Court in the same Journal for 1834, p. 556.
3, 4, 5, 6, 7. Ruinous topes of which the foundations have been dug up.
8. Cupola in which M. Court found an urn enclosing a glass prism.
9. Cupola wherein was discovered a box containing a bit of ivory.
10. Small mound whence were dug up fragments of bronze images.
11. Cupola which contained an urn of baked clay.

12. Square buildings attached to many of the Cupolas.
13. Tombs.
14. Mound from which were extracted many medals of copper and of caracoly (a compound of gold, silver, and copper.)

Pl. XX. represents what M. Court denominates a "symbole," also found among the extensive ruins of this curious place. We do not find it particularly described, but, from the general appearance of the sculpture it may be regarded either as a Buddhist or a Mithraic monument—probably the frame of some picture or shrine of a temple: and it is peculiarly interesting from the collection of symbols in the upper horizontal line, almost all of which can be recognized as belonging to the series of ancient coins about which so much has been written. The jar, the *swastica*, the sun, the altar, and especially the penultimate object on the right hand, which is common on the Kadphises coins.

All the country commanded by the elevated summit of *Manikyála* is much raised above the plain of the Panjáb. It appears to have been anciently a vast plateau, that in the course of ages, from the gradual action of periodical rains combined with occasional earthquakes, has been cut into deep ravines now difficult to traverse, which make it look like a heap of ruins. It is covered with villages, the inhabitants of which raise a thin and precarious crop on its very poor soil. The neighbourhood of the mountains is covered with a thorny and leafless jungle.

The whole district is called *Potwár;* it was formerly very populous, as at least testify the numerous ruins of old habitations. The villages are said to have run into one another, forming a continuous line for 16 kos from *Manikyála* to *Tammiák*. The mulberry and other fruit trees used to thrive in its gardens.

The ruins of *Ramma* are at 13 *kos* S. S. W. from *Manikyála:* they are attributed to Sitá Rami (?) Those of *Parvala*, traced to the time of the *Pandavas*, are on the north at 12 kos. At the latter place, in the gate of an old castle, is an inscription in an unknown character.

Traces of a very ancient town, *Dangèlí*, are met with 14 *kos* towards the east: the inhabitants ascribe its origin to the *Diws*. It flourished under the *Ghiker* sovereigns, who resided there. *Makkyala* near *Kattas*, *Benda* and *Pakhi* were also *Ghiker* towns. The modern town of *Bégram* is five kos lower down than *Dangèli*. It is now inhabited by *Chandra-vansis*, who are descended from the former rájas of the country.

In the neighbourhood of *Jelim* (a modern town of the *Peruzan* zemindars) are the extensive ruins of another castle perched on the top of an artificial mound, where very old Hindu medals are found.

The inhabitants assert that a city surrounded it called *Bidad-nagar*, which through the wickedness and cruelty of the *rája* was destroyed by an earthquake,—a fact borne out by the appearance of the mound. This hillock had been in generations past dug up in search of coins and relics. The walls were of brick, very massive and large: there were two or three reservoirs and some wells within the enclosure, one built of stone. The Cashmerians for twenty-five years have been in the habit of digging here, nominally for bricks, but evidently from their eagerness they have fallen upon more valuable spoil: the chief of *Jelim* has several times confiscated pots of copper and silver coins thus dug up. The greater part of these have a horseman on one side and a bull on the other*. At one time a number of squared blocks of red granite were dug up, and some door posts which have been since converted into objects of worship by some *Udásí faqírs* on the banks of the Hydaspes. One of them is sketched in fig. 2 of Pl. XX, and is seen to be the door post of a Hindu temple†. The fellow of it is set up at *Khallíh*, three kos N. N. W. of Jelim, by some *Ben-bába* faqirs. M. Court imagines this spot to have been the site of Bucephalia; and he would fix Nicea at *Patti-kuti* near *Vessa*, three *kos* E. of Jelim. In his opinion *Jelim* and *Aurangábád*‡ are the only positions in which two numerous armies could have encamped to dispute the passage of the river. Moreover, not a vestige of an ancient town is to be found on the west bank of the Hydaspes from *Kala Mangala* to *Dárapur*, except at *Sultánpur*, where the river debouches from the hills. In face of this spot is the fortress of *Kala Mangala*, attributed to Rája Sarwan. The opposite bank is too broken for Porus to have manœuvered his chariots. Below *Sultánpur*, at the small hill of *Barúti*, the inhabitants assert a bridge of boats formerly existed. Two kos further down, at *Menar*, are seen the remains of a castle of very great antiquity: the river once washed its walls, but has now retired half a league. It is accounted the customary place of crossing the river in former days.

* This description is insufficient to determine whether they are of the Azos group, or whether of the Rajput series; but as they are called above, *Hindu*, we presume the latter must be the case; and this will account for the large quantity of these coins procured by Keramat Ali and Mohan Lal in the Panjáb. It may also account for the inscription *Syálapati* on one series of them—"lord of the *Syálas*," whom Col. Wilford fixes as the people of Taxila, (see above.) —Ed.

† Capt. Burnes describes a *fluted* pillar with a capital very like the *Corinthian* order shewn to him by M. Court. He says also, that the inscription on the slab was in the Arabic character. Travels, i. 58.—Ed.

‡ Erroneously written *Uzengabad* on the map:—and *Morungabad* of Wilford.—Ed.

M. COURT recognizes the place of ALEXANDER's passage at *Khilipatan*, where is still the principal ford. It is five kos from *Jelim*, the Bucephela of our informant: agreeing with the passage in history, "ALEXANDER wishing to pass the Hydaspes, ascended four leagues higher up than where he had encamped, and there crossed his army at an island which facilitated the passage." This island is the one in face of *Khilipatan*, for at the village of *Gitiali* the river divides into two branches, one running towards *Jelam*, the other towards *Sukchandpur*. They enclose a large plain of cultivable ground. The western branch is only fordable in November, December, and January: it divides again into two branches at *Khilipatan*, thus forming several large islands, the largest being two leagues long by one broad:—the river beds are pebbly, and the current strong. The plain continues for four kos up to the ruins of *Patti Koti*; and here, doubtless, ALEXANDER must have had his encounter with PORUS' son, and with that prince himself, who came to his aid. All that PLUTARCH says of the passage and of the towns founded by ALEXANDER, tallies well with the above explanation.

The celebrated fortress of *Rotas*, now unworthy of regard in a military view, presents little beyond Muhammedan tombs and mosques in its ruins. There are, however, Hindu medals found there, but the particular class is not mentioned.

Pind-dáden Khán, a modern commercial town, is the great mart for the rock salt of the mountains on the west, now monopolized by RANJIT SINGH*. Other ruins of an ancient town, *Gagirákhi*, extend along the banks of the Hydaspes from near *Jelálpur* to *Dárapur*. On leaving the district of Pind-dádan Khán by the route which traverses the salt range, the site of an Indian annual pilgrimage occurs, called *Kattas*. Here again are the traces of an old town ascribed to the *Pandavas*, where are found small images of a red stone, holding in their hand the *toppa* of the Persians,—a species of iron club which would appear to have been a weapon of offence formerly in use. ALEXANDER was wounded by one in his attack on the fort of the Malli.

The district of *Thenni* bordering upon that of *Pind-dádan* is famous for its breed of horses and mules. After passing *Chekuvál*, *Nilli* and *Dula* on the *Suban* river, a ruined castle is pointed out where the sovereigns of old used to keep their treasure. Medals are here found

* See the description by BURNES in his Travels, vol. i. 52, and in the Journ. As. Socy. ii. 365.—ED.

in the ruins. The whole country is indeed remarkable for the number of antique ruins it presents: the most striking are those of *Tatta* and *Ris:* those of *Kounda* are attributed to rája Hoddi (?).

At *Jend,* 12 kos from *Khébbi,* towards *Kushálgarh* is a small gold-washing. *Fatehganj,* a very old town, is remarkable for its sulphureous springs: *Hassan Abdál,* for its picturesque situation and pure waters: the remains of a palace built by Akber here are still visible: it is on the high road from *Attok to Lahór.* Of these places it is unnecessary to speak, as they have been fully described by Burnes and other travellers; nor have we space to extract M. Court's notes on *Khanpúr, Skanderpúr, Naucher,* &c. Near the former place General Ventura opened several cupolas, and a large one at *Páhler* was explored by the native chief.

Of the district of *Pakhéri,* called by Forster *Pukholi,* this author would make Peucelaotis of the Greeks. This M. Court refutes, placing it (as noted in the memoir published last month) near *Bajore* (Bazira of the Greeks) on the west bank of the Indus.

We must also take but a very cursory view of M. Court's remarks on the physical geography of Taxila, hoping to see the whole published ere long in the Paris Journal, with the advantage of the comments of savans acquainted with the ancient history of the province.

The mountainous tract to the north of the district boasts the boldest and most romantic scenery. It is the link between the *Pirpanjál* range and the *Hindu-koh.* In the winter months there are but two or three passes practicable for foot passengers, and that with much hazard. Parallel ranges of less elevation occupy the southern face of the principal mountain ridge for a space of 40 to 60 *kos,* forming between them the successive valleys of *Kakabamba, Pakkhéri,* and *Mozafferábád.* Detached and irregular mountains and ridges cross the main chains at various angles, or form insulated groups, as is shewn on the map. There seem to be two principal lines of upheavement, which it would be abundantly curious to examine geologically on the principle of contemporaneous origin of parallel ridges started by M. Elie de Beaumont. The most interesting lines are the metalliferous hills N. W. of the Hydaspes, in general low, savage and uncultivated, but rich in ores. Ferruginous, sulphureous and saline springs are plentiful, but are not now turned to more use than the mines, which were apparently worked in former times. The Hydaspes formerly paid tribute in the gold of its own tributary streams. The Pinddádan chain has abundance of iron. At *Karengéli* near *Kattas* are mines of antimony:—in the *Gulrîh* range, native sulphur: near *Makhodi,* native alum: and at *Pind-dádan,* the salt mines before mentioned.

The vault of the large salt mine fell in shortly after the visit of M. JACQUEMONT. The section shews well the position of the salt, which is, in fact, a solid rocky mass : towards the upper part it divides into veins of white and red :—the latter are preferred ; the former containing lime and gypsum.

The western mine is greater in depth, but less extensive than the other. 250 steps were counted before reaching its focus :—the shafts were only wide enough for one person to pass at a time, each carrying a flambeau. The excavation is divided into two vaults ; one is now abandoned, being cut away to a dangerous precipice.

The lamps rendered the air and heat nearly insufferable when Messrs. WADE and MURRAY visited it in company with M. COURT.

On the surface of this chain are scattered large blocks of gypsum, worn as if by the action of the sea. Some yellow slates are also seen. Vegetation is confined to saline plants and a few thorny bushes.

Of the Indus and Hydaspes sufficient is already known. DANVILLE has fallen into an error in making the former pass by *Hashtnagar*, which lies on a small tributary called the *Jind*.

The climate of Taxila embraces extremes, from the healthy bracing cold of the snowy mountain to the excessive heats of the southern plains. The soil of the southern portion for want of water, as well as from the presence of salt, is little adapted for cultivation, and the villages are consequently very scant. In the beautiful valleys to the north, however, plentiful springs and a rich soil produce the opposite effects of fertility and a dense population ; but agriculture is neglected through the oppression of the Government. The perpetual verdure of the hills to the north affords abundant pasturage for cattle.

II.—ON THE PROVINCE OF PESHA'WAR*.

Pesháwar, the city, supposed by some geographers to be Peucelaotis, of the Greeks, is said by its inhabitants to be built upon the ruins of the ancient *Baghram*. In dimensions it certainly much surpasses *Cábul*, but its suburbs and the number of gardens which extend southward, contribute towards this apparent magnitude. Its houses are slightly built of brick or mud, held together by wooden frame work. This mode of building has, perhaps, been adopted on account of the earthquakes, which are frequent, but seldom very serious. The houses are generally provided with *Sard-khánas*, a description of cellar or underground room, where the inhabitants spend the day, to avoid the

* In this part of the translation, which follows the original more closely than the foregoing, we are indebted to the same fair hand, to which we were beholden on a former occasion.—ED.

intense and scorching heat of their summer. The streets are narrow and irregular, and present every where the most uncleanly aspect.

A large bazar runs across from east to west, commencing from the *Serai Gaur katra,* and terminating at the fortress of *Balasir.* A stream which draws its waters from the river of *Bahrêh,* crosses the town from south to north, and would very much facilitate the establishing of fountains, if the Asiatics only knew the use and advantage of them. The population of *Peshâwar* may be rated at 80,000 souls, consisting of Afgháns, Kashmerians, and Indians. The latter appear to have been its primitive inhabitants ; but although they are still very numerous, they live in dependence on the Mahomedans, and are oppressed by heavy taxation, (taxés d'avanies.) All the commerce of the country is in their hands. From *Cabul,* raw silk, worsted, cochenille, jalap, manna, asafœtida, saffron, resin, simples, and both fresh and dried fruits—all which are generally exported to India, from whence they receive in return, cambric, silks, indigo, sugar, and spices. To *Cashmir* the exports are gold sequins, gold and silver thread and lace, in transit from *Bokhára ;* and the return, shawls, tea, and Persian manuscripts. They exchange the salt of the *Kohát* range with the rock crystal and the iron of *Bijáwar:* this last district, as also those of *Sawát* and *Bunír,* offer a ready market for the sale of their tissues of cotton ;—the trades and arts of the town are limited to mere necessaries of life, and are principally carried on by the Cashmerians.

The Hindustáni is generally spoken, also the *Pashtu ;* the use of the Persian language becomes nearly extinct on entering this province. *Peshâwar* musters about 40,000 horse, a thousand foot soldiers, and twelve pieces of cannon. The troops are very irregular, and are badly paid.

The climate of the province is not very healthy. Fevers are very prevalent from the summer solstice to the end of autumn, at which period they generally prove fatal. They are brought on by excess in the eating of fruits, or by the unwholesome exhalations and vapours, rising from the rivers of the *Duáb.* The irrigation necessary for the cultivation of the Turkish corn in May, may contribute to engender fever, the heat of the air being then very intense. The inhabitants, ignorant of the superior properties of quinine, make use of a very bitter plant which grows on the banks of their streams. In 1835 I was encamped in this country with the French brigade, 10,000 strong, when we lost by these fevers upwards of a thousand men. Great inconvenience is also here experienced from swarms of flies, which prevent any nourishment being taken during the day ; for if

any of them be swallowed with the food, they occasion a vomiting, attended with very severe pain in the loins and in the chest. Snakes and scorpions are also in great abundance, and are often venomous.

The spring sets in early: by the end of February the peach trees blossom luxuriantly; by the end of April the weather becomes unpleasant; and the heat is scorching during the months of June, July, and August. In June the *Simum* prevails; it is sometimes pestilential, resembling the desert blast *(Samial)* of Arabia. When it blows, one would fancy that one stood at the entrance of a hot oven. "Heaven pity then," the poor traveller, who is overtaken by this wind at midday in the open country! When first attacked the body becomes covered with blue spots, and putrefaction is almost instantaneous. This wind generally blows from W. N. W., in the direction of *Jelálábád*, where it is frequently fatal. The hot season ends in September. The rains are heavy in the winter, when the sky is frequently clouded for a week together. There are intervals of rain also in April, but rarely. In July and August, the rainy season in India, little falls in these parts, but storms are very frequent, and very severe, and are always preceded by whirlwinds of dust, obscuring the atmosphere for hours together; they are brought on by the S. W. winds, and are accompanied by claps of thunder in rapid succession. The lightning falls with fearful flashes.

The environs of *Peshâwar* exhibit little else but a vast space covered with ruins and tombs. I discovered and dug out several remains of Indian statues. These statues, some of which are in plaister, others in bronze, appear to be of very ancient date, for they are devoid of beauty and are ill executed. They principally represent *Gauraknáthí faqirs*, or perhaps *Jogis*, who for a long time held the country west of the Indus. The image represented (in Plate XXVI.) was dug out of the village of *Banamarí*, which lies west of *Peshâwar*. At a greater distance are the ruins of *Pirigèl*, where in the rains Indian and Bactrian medals are to be found. To the west of *Peshâwar* is a mount upon which an ancient castle appears, which may be the one that Hephæstion besieged, and which was re-established by Timour Shah, and was subsequently sacked by the Sikhs. The Sikhs again rebuilt it in 1834, when this province fell into the hands of Ranjit Singh, in consequence of a victory gained over the Afghans by the division under my command. The gardens which stretch from the south to the west of the town present the appearance of a forest of orchards, where they cultivate the plum, the fig tree, the peach, the pear, the mulberry peculiar to this country, the pomegranate, and the quince: but these fruits, although beautiful to the eye, are very far

from having equal flavour with those produced in the south of France. The grape is only cultivated at the village of *Shèkh Imâm Mehdí*.

Peshâwar is situated in the middle of a vast plain, which stretches towards the N. E., and which is twenty-five kos in length from the east to the west, and fifteen in breadth from the south to the north. The mountains of the *Kattiuks*, and the *Afrédís* bound it to the east, and those of *Kohât* on the south. To the west it is bounded by the mountains of the *Kheibars*, and to the north the river of *Nagumán* separates it from the districts of the *Duáb* and of the *Yusafzais*. This plain is crossed by the river *Bahreh*, which has its source on the southern side of the *Koh-sufèd*, crosses the Kheibars, enters this district at *A'lam-gújar*, and after a short passage empties itself into the *Nagumán*, seven kos east of *Peshâwar*. Without it the district would be nothing but a barren desert. From June to September the river is dried up by the many drains made to irrigate the cotton plantations and the barley fields. The principal water-courses strike off at the village of *Serband*, and are divided lower down into an infinity of lesser ones, which give astonishing fertility to the soil of this district, and promote the cultivation of rice, which is principally sown in the village of the *Máshtúrzais*, and is much prized by the inhabitants of *Afghánistán*, and the *Panjáb*. The river *Nagumán*, which I presume is no other than the Malamantus of the Greeks, formerly ran to the west of *Peshâwar*, and you may still trace its bed near the ruins of *Rashekí*. It appears that some sovereign of the country must have changed its course, in order to fertilize the land of the *Mumunds*, which extends to the south of the town. This tribe, as well as that of the *Kaleels* who inhabit the west, have often bloody contentions for the water. The districts of the *Dáúdzais* and of *Kalessa* are watered by the canal of *Budèní*, led from the same river of *Nagumán;* its waters are so favorable to vegetation, that grass grows on its banks to the height of a full grown man. The territory of *Peshâwar* is, generally speaking, most fertile, rivalling the best in Europe if it were but well administered. The harvest is gathered in the summer, and again in autumn. That of the summer yields an abundance of barley and corn,—that of the autumn several kinds of maize, rice, oil seeds, and abundance of cotton, which provides the inhabitants with a species of manufacture suited to the climate. Wood is procured in great scarcity from the surrounding mountains, on which very little grows.

This country on every side presents to the view ruins of ancient towns, of the very origin of which the natives are ignorant. The most striking are those of *Khohusser*, more commonly known by the name of the *Takkal*, where are the vestiges of three massive

cupolas, of very ancient date. Not far from thence are the ruins of *Rachekhi*. Further off the remains of the town of *Jamrud* may be observed at the entrance of the defile of the *Kheibar* mountains. The route from *Peshâwar* to *Michiní* betrays signs of old habitations at *Pirbala* and *Pessank*. The road to *Kohát* presents also the remains of *Boulidana*, which may possibly be Embolima of ALEXANDER. Quite close to this, *Deliter* may be seen; and further off, at the entrance of the defile of the *Kohâts*, are the ruins of *Kargan*, *Akor*, *Zendán*; and in the districts of the *Múmunds* may be also seen those of *Aspínagar*, *Bassevanan*, and *Ormúl*.

The province is divided into six districts; namely, the *Kaleels* to the west, the *Múmunds* to the south, the *Dáúdzais*, the *Duáb* to the north, the *Kalissa* to the east, and that of *Hashtnagar* to the north-east. These several districts yield a revenue of eight lakhs of rupees, without including the cantons of *Kohát* and *Lachiteri*, which bring near two additional lakhs. The district of *Kohát* is inhabited by the *Bungeish*, and is celebrated for the beautiful springs of limpid water which meet at the foot of the surrounding mountains. A coal mine exists in this territory, but the inhabitants derive but small profit from it. A mine of sulphur is also to be found there, but it is not worked; and some petroleum wells or mineral tar, which the inhabitants use to light up their dwellings. Adjoining to this pergannah are the districts occupied by the *Theris*, and beyond this is the province of *Banúták*.

The district of the *Duáb* is so called, because it is enclosed between the two rivers of *Nagumán* and *Jindi*. It is very fruitful in rice and sugar-cane, and abounds in beautiful and fertile meadows. It is inhabited by the tribe of the *Gigiánees*. In the district of the *Abázais* are the ruins of *Gound*, but their origin is not known. Still further in the direction of *Tengi* is the isolated mountain of *Azarneh*, which might well be supposed to be the Aornus, the conquest of which was one of ALEXANDER's most brilliant exploits. The fortress of *Hissár* is only ten kos to the N. E. of *Peshâwar*: it is situated three kos from the river of *Nagumán*, in an island formed by two branches of the river *Jind*, which flows from the outskirts of *Sawát* and *Bajáwar*. This fortress is conspicuously raised on a small artificial hill. At its foot are extensive ruins of an ancient town, apparently founded by idolaters, and upon which is built the actual town of *Hashtnagar*, a name meaning the seven towns*. Our geographers

* Hashtnagar, meaning eight towns. The whole eight are named on WILFORD's map.—ED.

think that this town is the same as *Massaga*, the capital of the *Assaceni*, but I am more inclined to think that it is the *Nysa* of the Greeks. Its proximity to the Cophenes, and above all what Plutarch states as said by Alexander to his Macedonians, when they objected to fording the river on account of its depth, corroborate my conjecture. The inhabitants of the *Duáb*, and those of the mountains of the *Mourmards*, appear to me to be the Assaceni, who were employed by Alexander in building the vessels, in which they sailed down the Cophenes as far as Taxila. To the N. E. of *Hashtnagar* is the mountain of *Behhi* standing alone on a vast plain, and close to it are the ruins of an ancient castle which is attributed to *Rajya Varrah*, and which, according to the traditions of the inhabitants, was the dwelling of the ancient sovereigns of this country. There are also some basso-relievos, and the traces of an aqueduct by which the waters were carried to the river *Jind*. This aqueduct commences at the ruins of *Rajir*, which are situated nearly opposite *Hashtnagar*. Further off in the district of the *Babúzais*, on another mountain, are the massive ruins of another fortress, which can only be reached by means of a path cut through the rock. It goes by the name of *Peli*.

Three days' journey north of *Hashtnagar* are the districts of *Sawát* and *Bunir*, where are the ruins of *Geríra*, *Bonsekhan*, *Zakút*, and *Chímkor*. Near the latter are four massive cupolas of the same kind as those of *Manikyála*. The small river *Panjkorí* traverses the district, and joins the *Jindi*. It is much to be regretted that travellers do not visit with more minuteness this portion of the country, as they might, were they to do so, gain positive information as to the march of Alexander on the banks of the Indus. It is in these districts that Birbel, the Vizier of Akber, perished with a whole army. The inhabitants have, we are told, cut a road through the rugged rocks, leading to the north, by means of which they communicate with the Tartar tribes of *Kashgar* and others. All that tract of country lying to the east of *Hashtnagar* is inhabited by the tribe of the *Yusufzais*. The Indus forms the eastern boundary of this district, and *Landeh* on the river *Nagumán* its southern. To the north are the mountains of *Panjitar* and *Shemla*. According to some historians, the province of the *Yusufzais* is the same as the Taxila of Alexander, where the king Omphis reigned, whose fidelity and devotion facilitated to Alexander the conquest of the Indus. But, according to other historians, and more especially in the opinion of Plutarch, the real Taxila was that country enclosed between the Indus and the Hydaspes.

The province of the *Yusufzais* is divided into eleven tappas—viz :

		Principal Towns.
Two tappas...	Sedu-zais,	Hound.
	Otuman-zais,	Toppi.
Five tappas, Rezers ..	Keder-zais,	Khiva.
	Mamu-zais,	Nohdéh.
	Malek-zais,	Yar-hosein.
	Akukhels,	Ismaila.
	Mani-zais,	Toulandi.
Two tappas, Amazais.	Ismael-zais, Daud-zais,	Kapurdigarbí.
Two tappas, Kamalzais.	Kamal-zais,	Ottí.
	Kamal-zais,	Túrú.

All these districts are governed by independent chiefs, who live in the greatest dissension. There are no taxes established, and each inhabitant rents, cultivates, and reaps the produce of his grounds, paying only a small sum as tribute to the chief of the district. It is only since 1822 that the Mahárája of Lahore succeeded by the force of arms in levying five rupees on every house and a certain number of horses, with which they are obliged to furnish him annually. The tribe of the *Yusufzais* is one of the most powerful in *Afghánistán*. It has always been remarkable for the independence it has preserved, and for some time it resisted the attacks of the Mogul kings, and even Nadir Shah himself, who never thoroughly succeeded in subjugating it. The people of this tribe are vigorous, active, turbulent, and have given proofs of extraordinary courage in the wars which they have had to sustain against the Sikhs. When public danger is threatened, all the districts suspend their own quarrels, and gather together to make common resistance. Each one provides himself with weapons at his own expense, and volunteers as a soldier under the banner of his chief. This soil is extremely fertile in every kind of grain, yielding a plentiful harvest of maize, beans, peas, cotton, oil seeds, and excellent tobacco. The mountains towards the north afford excellent pasture for all kinds of cattle. The province contains no town, properly so called, but it is embellished by large and populous villages : the principal one amongst them is *Kapardigarhí*, standing in the midst of the ruins of a very ancient town, which might very possibly be the Caspatyrus of the Greeks, the capital of the Gandári, whom our geographers place to the east of the Assaceni on the western bank of the Indus. Quite close to this village I observed a rock on which there are inscriptions almost effaced by time, and out of which I could only decipher the following characters. (See Inscription 5, of Plate XXVII.) Further off, on the opposite side of the mountain of *Koh-ganga*, are

the ruins of an ancient town, which is attributed to a heathen race; and quite close to that is the village of *Bazar*, now inhabited by the *Kamalzais*. Not far from thence is another very extensive ruin, where several remains of statues have been found*. In the land of the *Yusufzais* also are the ruins of *Motina* near *Yar-hosein*; those of *Gagri* and *Shirkand* near *Ismaila*; *Kirkand* near *Mayar*, in the district of *Otti*; *Kaleder* near the stream of *Kálapáni*; *Mashari-Banda*, on the river *Landeh*; and *Pélussedán*, opposite *Messa*. Besides these ruins the country is covered with an immense quantity of small artificial hills, on which there are remains of ancient dwellings, and where, in the rains, Indian, Bactrian, and Indo-Scythian medals may be found. Near *Panjitar* are the ruins of *Nogiran*, where there are inscriptions in the same character as those noticed above.

In the district of *Shemla*, which is further to the north, we remark those of *Nágari*, where basso-relievos may be seen. On the banks of the Indus are the ruins of *Péhour*, *Toppí*, *Hound*, and *Mahmedpur*, of which I have already spoken. The river *Landeh* or *Nagumán* separates the *Yusufzais* from the province of *Katiúks*. This country is very mountainous, and contains mines of sulphur, salt, springs of naphtha, and many slate quarries. It is inhabited by the tribe of the *Kattuks* and the *Aferidis*, intrepid mountaineers, who often intercept the route from *Attok* to *Pesháwar*. Their chief towns are *Nizámpur* and *Sirrí* in the interior, and *Akhoreh* on the right bank of the *Nagumán*. This last town may be presumed to be the *Ora* of Arrian. If this be the case, the inhabitants of the mountains of the *Katiúks* are descendants of the *Assaceni*. The province of the *Kattuks* is divided from that of *Kohát* by the district of *Lachitrí*.

III.—*Facsimiles of Ancient Inscriptions, lithographed by* Jas. Prinsep, *Secy. &c.*

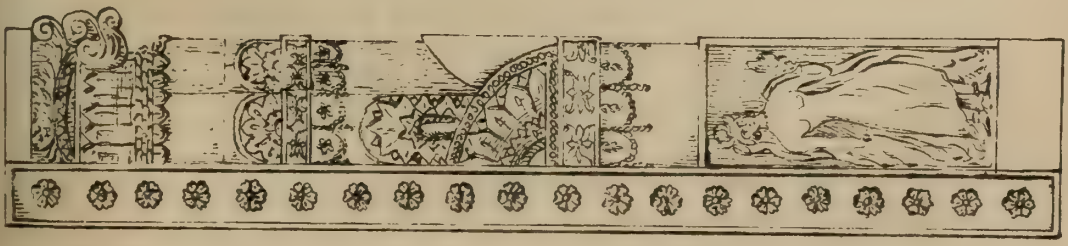
[Continued from page 349.]

Pl. XXVI. 1.—*Asírgarh inscription.*

This inscription, for the knowledge of which I am indebted to the antiquarian zeal of Dr. J. Swiney, has been in the possession of Dr. Mellish since the year 1805, when, according to a memorandum on the original drawing, it was copied from a wax impression of a seal found at Asirgarh by Captain Colebrooke, of the Engineers. By the three notes in pencil at the top, (which I have

* We have lithographad in Pl. XXVI. a bronze head dug up probably at this place by M. Court. It bears a Sanscrit inscription.—Ed.





Reduced from a drawing by Mons.r A. Court. NK

inserted), it would appear that the seal was surmounted by three series of figures, probably cast in bronze: viz. in the centre, *Nandi* the bull, with a state chatta over him, and supporters on either side, bearing, the one, a chatta and axe; the other a sceptre and axe.

The inscription, hitherto undecyphered, is at once seen to belong to the old form of *Deva-nágarí*, now grown familiar to us; and I am indebted to the Rev. Dr. Mill, for the subjoined transcript in the modern character, as well as for the translation of the text, and remarks on the same.

From the absence of a date it is not easy to assign a certain position to the five distinct successions which it embraces; though, from the locality of the inscription in a fort of *Khandésh* immediately south of *Málwá*, as well as from the termination of the names in *Varma*, they may be assigned with some probability to the *Ujjayani* dynasty; where, in the twelfth century, we find Naravarma, Yasuvarma, and three other *Varmas* recorded as having reigned. No one of these names, however, accords with any of the present list; neither does the modern Nágari of their inscriptions, of which Colonel Tod has published facsimiles, at all resemble the seal character, which is evidently of a much more ancient date. It is customary, also, in Hindu records of this nature, to commence with the reputed ancestor of the race; but we find no allusion to Vicramáditya or Bhoja in the present instance, and must either suppose our seal anterior to these illustrious personages—or unconnected with *Ujjayani*. It is certainly possible that a petty rája might have maintained independence for a few reigns in his hill fort, claiming descent from the unknown Hari-varma; but it is unlikely that he should have assumed the lofty title of *Mahárájadhirája*.

The twice recorded matrimonial connection with the Gupta family is also worthy of remark, as it may possibly have reference to the *Canouj* dynasty, whose coins have lately excited so much interest. The style of alphabet affords strong evidence of their contemporaniety.

Transcript of the Asírgarh inscription in modern Deva-nágarí.

1 चतुस्समुद्रातिक्रान्तकीर्त्तिः प्रतापानुरंगापनतान्यराजः पर्णाश्रमव्यवस्था
2 मतप्रवर्त्तो वक्रशुक्रधनवप्रस्सामर्त्तो हरिश्रीमहाराजहरिवर्म्मा तस्य
3 पुत्रस्तत्पादानुध्यातविजयः श्रीमतोतद्वारांकदेव्यामुत्पन्नः श्रीमहाराजादि
4 त्यवर्म्मा तस्य पुत्रस्तत्पादानुध्यातहर्षो गुप्तान्वयजारिकार्य्यामुत्पन्नः श्रीमहारा
5 जेश्वरवर्म्मा तस्य पुत्रस्तत्पादानुध्यातगरिमा गुप्तान्वयजारिकार्य्यामुत्पन्नो
6 महाराजाधिराज श्री.र.सिंहवर्म्मा तस्य पुत्रस्तत्पादानुध्यातहर्षयु
7 क्तो भारकामहर्य्यामुत्पन्नः परमहरीश्वरो म
8 हाराजाधिराजश्रीखर्व्ववर्म्मा ईश्वरः ।

Translation.

"He whose glory was transcendent by reason of his four great goods*,—before whose splendour other kings bowed, sickened with envy,—who was ever occupied in the juridical decisions of learned Munies dwelling in leafy hermitages,—whose crooked ramparts were alike bright and impenetrable,—who was the spoiler of all such as were vexed with peace,—(such was) the great king HARI-VARMAN. His son, whose excellent victories equalled those of his father, born of his noble† wife ANKA-DE'VI', was the great king A'DITYA-VARMAN. His son again, whose exceeding joys equalled those of his father, born of ARIKA'RI'‡, eldest daughter of the GUPTA race, was the great king I'SVARA-VARMAN. His son, whose magnificence equalled that of his father, born of ARIKA'RI', eldest daughter of the GUPTAS, was the great king of kings R. SINHA-VARMAN. His son, possessed of like exceeding joys with his father, born of BHA'RA KA'MA-HARI', was the chief of the excellent lion-rulers, the great king of kings KHARVA-VARMAN, our worthy Lord."

It is observable—that the title of *Rája-adhirája*, or king of kings—is here, as in the Allahabad inscription, restricted to the two last of the line of succession—viz. SINHA-VARMAN, and KHARVA-VARMAN. I do not understand the simple letter R. prefixed to the former name, (viz. a र with a dot preceding and following)—unless it be an abbreviation for Rája: nor am I quite sure of the three letters following the last name, which I have made ईश्वरः W. H. M.

Inscription on a bronze image from Peshâwar.

The head depicted in Plate XXVI. is copied from a sketch in M. COURT's memoir and collection of drawings, from which extracts are published in the present and in the preceding Journal, (see p. 482.)

The characters are decidedly Deva-nágarí, but whether from their indistinctness, or from errors in the copying, or from the language being different, their combination does not form any intelligent Sanscrit sentence.

* i. e. *Religious duty*, धर्म्म; *wealth*, अर्थ; *pleasure*, काम; *eternal salvation*, मोक्ष. Such are the four *Bhadras* or goods according to the Hindus. Amera Cosha, ii. 7, § 3, sl. 57. If, however, for स्वभद्र we read समुद्र with PREMA-CHAND Pandit, the translation will be, "He whose glory transcended the bounds of the four encircling oceans."—W. H. M.

† The ordinary honorific epithet *Srímatí* is here, contrary to the usual rule, introduced into the compound in the feminine gender. Regularly it should either be the crude form *Srímat*, or the locative case feminine *Srímatyám*.—W. H. M.

‡ The recurrence of the same name and description is singular. It is impossible that they should be the same person, such incest being unknown even to the heroic age of India.—W. H. M.

The head has its hair gathered in a knot after the fashion of the Hindu devotees, and it is bound together by a triple-headed snake of the cobra species—an ornament not uncommon to Jain figures, but rarely seen in the simple head of Buddha. The ears seem to be lengthened and split, in the style of the *Kánphatí* sect; but the drawing may also be viewed as of earrings in ears of the natural dimensions.

Pl. XXIX.—*Inscriptions on Kemaon Tridents.*

On the right hand side of Plate XXIX. is depicted the bronze trident at *Barahát* in *Garhwál*, reduced from the large native drawing presented to the Society by Mr. Commissioner TRAILL, last winter. The inscription on the shaft was published as No. 2 of Plate IX. with a translation and explanation by our Vice-President, Dr. MILL. The copper letters being in relief from the shaft were taken off in facsimile.

The same plan, Mr. TRAILL says, did not answer with the trident at *Gopèsvara*, although the *ancient* letters on its shaft are soldered on in the same manner.—The copy taken by the eye of a native draughtsman is unfortunately too incorrect to be legible: but the form of many of the letters shews clearly that this inscription is of the same age as that of *Barahát*.

On the upper part of the trident are three or four short inscriptions in the modern Devá-nagarí. These, Mr. TRAILL says, are cut into the metal. Three of them are illegible, or rather appear to be in some other language. One only is in Sanscrit; but in this also several errors have been committed by the transcriber. With the assistance of the Society's pandit I am able to present it in a complete form:—it contains a name—the grand desideratum in such cases; though too often, as in the present instance, it turns out to be a name unknown to fame! The verse is in the accustomed *Sárdúla Vikrídita* measure, so often mentioned by Dr. MILL. It opens with the invocation *Aum Svasti*.

ॐ स्वस्ति ॥ कृत्वा दिग्विजयं महाभय महादेवाग्रसंस्थामिमां राज्ञः
श्रीमद्णेक* मल्लदपतिस्तम्भङ्गान्नीतवान ॥
पश्चाच्च प्रतिरोप्य तच्च विजयस्तम्भं प्रतिष्ठा
मगादुत खातप्रतिरोपणं हि महतां युक्तं नतानां पुनः ॥

"The illustrious Prince ANIK MALL, having extended his conquests on all sides, brought together (quere, humbled or made low) upon this

* The proper grammatical reading would be श्रीमदनीक

holy spot sacred to Mahádeva, under the emblem of a pillar, the very sovereigns of the world whom his prowess had overcome ;—

" And thus having re-established this same pillar of victory, he acquired reputation. It is a pious act to raise up a worthy foe when he has been humbled."

' Parcere subjectis et debellare superbos' seems to be the sentiment here inculcated ; and it is probable that the allegory of overthrowing and restoring enemies, alludes to the taking down the pillar (which may have been done to cut the new inscription) and its restoration, by some rája who had penetrated thus far in a successful expedition.

The name of Mall occurs as a patronymic in more than one dynasty of Nipál. It is not impossible, therefore, that the name here written Anik Mall, may be the same as the Anya Mall of the *Neverit* race, who reigned in that valley about the year 1195 A. D. according to Kirkpatrick's Sketch. Anya, which is without meaning, should probably be written Ani'k.

IV.—*Sub-Himálayan Fossil Remains of the Dádupur Collection. By Lieuts.* W. E. Baker, *and* H. M. Durand, *Engineers.*

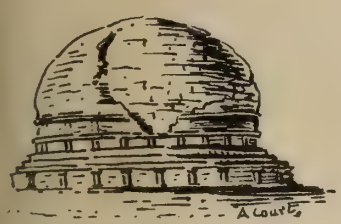
[We should be wanting both in candour and courtesy, were we not to point out to the reader, that the plates accompanying the present paper were furnished by our zealous contributors, and their esteemed commandant Col. Colvin. In despair of the difficulty and expence of executing so many plates in Calcutta, it occurred to us that the same pens and pencils which could produce such neat original drawings, could, if provided with the requisite materials, furnish engravings and lithographs ready executed for our Journal. We accordingly dispatched some yellow paper, and a copper plate, by dâk, to Dádupur ; and these are the first fruits. If not quite perfect, it should be remembered that the transfers had to travel 1,000 miles in the height of the rains ere they could be secured on the stone—and that the copper-plate, with its waxed and etched surface, had to be bitten by the acid after its arrival in Calcutta. The wonder is, that they should have turned out so well ! We anticipate much greater success hereafter.—Ed.]

RHINOCEROS.

The manner in which the organic remains of the Sub-Himálayas were at first deposited, and that in which they have been subsequently disinterred, have necessitated a system of search more favorable to the acquisition of specimens than to the accurate description of the localities in which they occurred. Hitherto the fossils were in general found widely scattered over the surface and throughout the ravines of the calcareous sandstone formation ; a dispersion which rendered gleaning from the hill surfaces preferable to excavation at any one place, affording the certainty of a larger number and greater variety of spe-

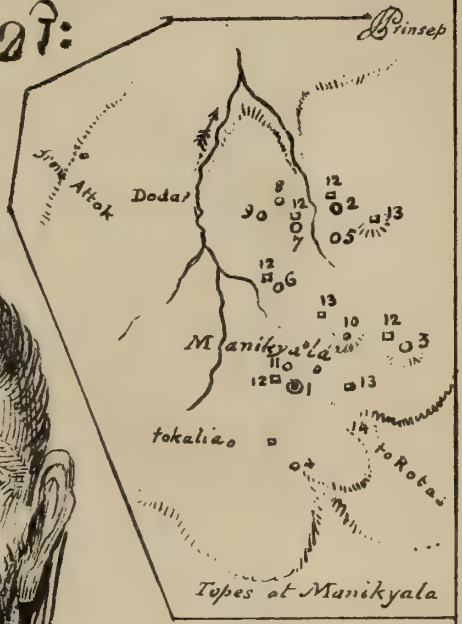
From the wax-impression of a **Seal** *found at Asir-garh.*
taken by Capt. COLEBROOKE *in* 1805: *preserved by Dr.* MELLISH.

MAN WITH CHATTA AND AXE - NANDI WITH STATE CHATTA - MAN WITH SCEPTRE AND AXE



Elevation of the MANIKYALA TOPE.





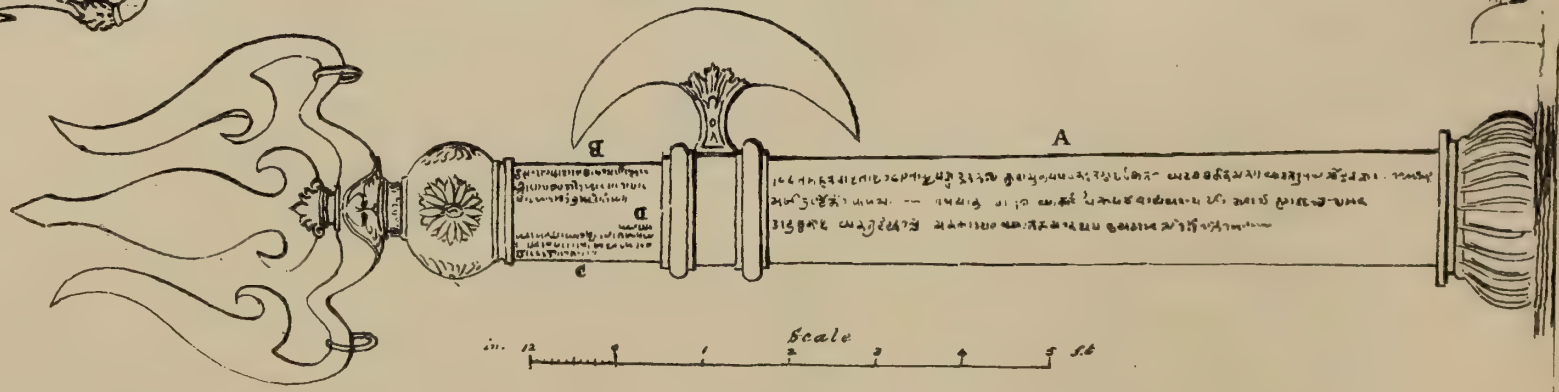
BRONZE HEAD *dug up at* PESHAWAR *by* M.A.COURT.

J. B. Pearson's Lith.c Press - Calcutta.

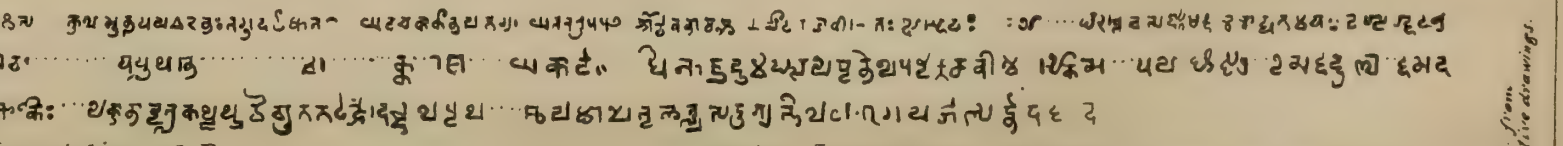
Trident at Barahát in Garhwal.

21 feet high.

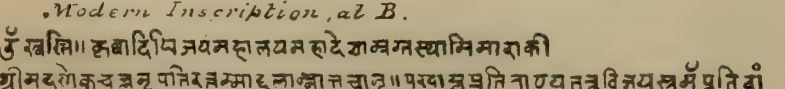
Trident at Gopesvara. 16 feet high.



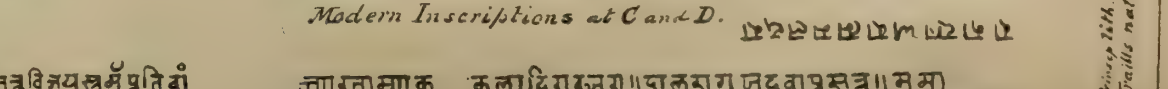
Ancient Inscription on the shaft of the Gopesvara trident, at A.



Modern Inscription, at B.



Modern Inscriptions at C and D.



Journal As. Soc.

Printed at the Oriental Lith.e Press—Calcutta.

T. Prinsep lith. from Mr. Traill's native drawings.

cimens than could be anticipated to result from any other mode of collection. Notwithstanding these circumstances, however, it was soon observed that the different parts of the head, the various fragments of one limb, picked up at considerable distances from each other, could with a little trouble be extracted from the heaps and assorted; the sharp edges and accurate junction of the fractured surfaces preventing any doubt or mistake. Such restorations proved that whole extremities, perhaps entire skeletons, must occasionally have been entombed in the sand, and that the upheavement of the strata causing the greater number of fossils to be traversed by cracks, divided them into a number of fragments, which, on the degradation of the strata, were swept away by the drainage water to various distances from their original sites. It became an object, if possible, to discover these sites; with this purpose in view, many of the abrupt cliffs and fresh slips, with which this tertiary formation abounds, were examined; but with such little success as to render it evident that the gradual wear of ages could alone have sufficed for the exposure and dissemination of so vast a quantity of these relics on the slopes and in the ravines of the hills. The scattered fragments were seldom found to give any clue to the original place of deposit: in fact it has but once occurred to us that a nearly entire extremity has been discovered in the calcareous sandstone. And in order to illustrate the foregoing remarks, we have appended a sketch of these remains*; the drawing represents them as they lay after the removal of the sand which at first concealed all but the lower fragment of the femur: pieces of tusk, bones, and the half of a lower jaw, were found in the immediate neighbourhood, and indicated that the other parts of the skeleton of this *mastodon elephantoides* had originally been deposited at no great distance from the posterior extremity which forms the subject of the sketch. The whole may be considered a fair example both of the mode of deposition and of the subsequent dispersion which lodged separate, sharp-edged fragments on the hill sides and amongst the sandstone boulders of the water-courses. The rare occurrence of specimens under such favorable circumstances rendering excavation a very uncertain and ill requited labour, forced the native collectors to be satisfied with the crop which time had exposed.

* We regret exceedingly that the drawing on transfer paper of the fossil *in situ* was spoiled in passing it on to the stone. This was the case also with Plate XIX. a very beautiful drawing by Col. J. Colvin: but the latter officer having taken the precaution of forwarding its original, a tolerable attempt has been made to supply its place by M. Tassin. The initials W. E. B. to this plate have been inserted by mistake.—Ed.

Hence, too, the localities of fossils thus collected at places remote from each other did not admit of being accurately specified ; a circumstance of less importance so long as the species, sometimes even the genera, exhibited characters distinct from the fossil and existing species hitherto described ; but the species about to be noticed being an approach to an existing type, we consider ourselves fortunate in having witnessed the exhumation of many of the specimens referred to in this paper, and are only sorry that the limited time at our disposal was insufficient to enable us to take a plan and accurate sections of the ground.

The following general description may, however, give some idea of a locality which furnishes an exception to other places whence fossils have been obtained ; in this instance they have not been met with in solitary fragments, but found massed together ; and excavation has been resorted to with advantage. Though but an imperfect description, what follows may suffice to point out the site in question, and it has therefore been introduced.

The deposit is situated about a mile and a half to the N. W. of *Maginund*, a village on the left bank of the easternmost affluent to the *Caggar*, (or Gagur of some maps), immediately at the debouche of the channel from the hills. On leaving the village, crossing over to the right bank, and skirting for a short distance in a westerly direction the base of the hills, the bed of a tributary is reached, which, on being traced up, leads to the deposit. The formation here consists alternately of strata of calcareous sandstone and of strata of a loamy texture, composed of a mixture of sand and clay ; the proportions of these ingredients of course vary continually, but in general they are nearly equal ; the clay colours the strata, giving a brownish red shade. The calcareous matter which enters into these loamy strata is usually in small quantity, and they are so little indurated that some of the blocks, although sheltered from the force of the rain itself, fall to pieces when exposed to the damp atmosphere of a rainy day. The fossils extracted from this matrix are more fragile than those imbedded in the calcareous sand, and much care is requisite in disengaging them.

A hasty or distant view of the sections which here, as elsewhere, abound, might lead to the conclusion that the loamy strata predominate ; for being, as above described, but little indurated and easily acted upon by damp and rain, they tinge the calcareous sand strata beneath them by covering their exposed sectional surfaces with red or ochre-coloured particles. The consequent effect is very deceptive ; but on closely examining many sections, we invariably found the sand

to predominate. The part of the hills here alluded to is barren of wood. The strata evidently suffer very rapid degradation, in consequence of the facility with which the clayey beds yield to the abrading force of the drainage water; by means of the loose stratum, the more enduring sandstone is as it were peeled off, and covers the hill slopes with its debris. The dip of the stratification has a general N. E. direction.

The circumscribed space, more immediately under consideration, consists of about one hundred feet of ravine along a stratum of loamy texture. Within this confined space specimens of all the genera, contained in the synopsis of our collection, have been found: that is to say, the same bed which yielded so many remains of the fossil unicorn rhinoceros, likewise produced the half of the upper and lower jaws of a young sivatherium; many bones of the extremities of adult animals of that genus, or of a ruminant of as large a skeleton as that of the sivatherium; the anterior half of the head of an animal which presents analogies both to the palæotherium and anoplotherium; and, in short, exemplars of all the genera excepting the hippopotamus. The remains of fish and tortoises must also be added to the list of classes not hitherto discovered in this deposit: exceptions, however, which are probably accidental, as the plates of saurian animals have been obtained from thence.

The osteological remains, although strangely amassed together, are frequently perfect; in many instances whole extremities have been disinterred; there are cases of the greater part of whole skeletons being dug out, but these are rare; whole craniums of large animals have not hitherto been met with; a circumstance which, considering the number of their bones, would be unaccountable, had we not grounds for taxing the carelessness of the excavators as in part answerable for the anomaly. Perfect craniums of the smaller animals are of frequent occurrence; in one block we counted *five* craniums of antelopes, close together; not all equally perfect, as one of them possessed even the core of the horns complete, but with the molars and greater part of the head present, so that all error is excluded. Animals of the same species are not always thus heaped together: on the contrary, the relics of very different species may be frequently observed in contact. One block of moderate dimensions presented the assemblage of remains of the sivatherium, rhinoceros, sus, crocodile, of a large feline and a small carnivorous animal, of antelope, and of an undistinguished ruminant. Another block gave the head of a species of gulo, accompanied by the plate of a saurian animal. To the rhinoceros femur and tibia, (Pl. A) we found attached the astragalus of

an elephant and metatarsal of a rhinoceros : it would however be useless to mention at greater length the juxta-position of specimens in this stratum ; suffice it to add, that sometimes, perhaps in general, the skulls and bones of the same species are found together ; at others, however, as above described, the remains of very different species occur together.

There is one remarkable fact deserving of mention ; which is, that by far the greater proportion of the craniums from this deposit are those of young animals ; the adult bear a small proportion to them.

From the above site the fossils selected to form the subject of this paper have been obtained, with the exception of the following.

The cranium, Pl. XV. which was found about three miles from the Maginnud deposit.

The separate teeth, fig. 5, 6, 7, 8, Pl. XIX. which were brought at different times and without any account of the places at which they were obtained.

The fine fragment from a lower jaw, fig. 6, 7, Pl. XVI. which is in the possession of Conductor Dawe, of the Canal Department, to whom it was brought from the vicinity of the *Haripur* pass.

Cranium. We shall commence with the fossil, which being the most perfect, affords the best means of instituting a comparison with the skulls of described species. It forms the subject of Pl. XV. in which three views are given, which were taken with a camera lucida—the instrument and the distance of the cranium were so adjusted, that the reflected image was exactly one-sixth the size of the original. We are indebted to Colonel Colvin for the delineations in this plate.

The fossil cranium is imperfect in the following parts. The extremity of the nasal and intermaxillary bones are broken off ; the zygomatic arches are both fractured ; the left occipital condyle is wanting ; the following molars have either dropped out prior to the envelopment of the head by the matrix, or have been broken off subsequently to its fossilization, viz. the fifth of the right, the first and seventh of the left maxillary. In addition to these losses the cranium has undergone, when in the stratum, the common fate of sub-Himálayan relics, and is cracked in several directions : the crush, however, which produced these cracks has not materially altered the form of the head ; the chief effect produced has been the forcing the left half palate at its anterior extremity a little above its proper level ; this the longitudinal crack passing through the left orbit enabled it to accomplish ; the displacement resulting may be best observed in the profile view of the skull, fig. 3. The transverse cracks are accompanied by a small hollow and a consequent neighbouring bulge, both so partial and

of such small relief, that in the profile their places can only be observed by paying attention to the jagged outline at the depression of the frontals. With the above exceptions the specimen is perfect.

A glance at Pl. XV. will be sufficient at once to determine the species with which this fossil rhinoceros must be compared. The depression of the frontals causing the deeply curved outline of the upper planes of the head; the slope of the occiput; the septum and its nasal arch—all separate this cranium from the existing and fossil bicorn species. The existing unicorn species is that, therefore, to which recourse must be had in order to establish a comparison.

In the unicorn rhinoceros of Java the height to which the crest of the occiput rises above the palatal plane, as also the thickness and prominence of the nasal arch supporting the horn, are less than in the Indian rhinoceros. A line drawn tangential to the crest of the occiput and the highest point of the nasal bones will, in the unicorn species of India, be more raised above the plane of the frontals than is the case in the Javanese rhinoceros. In the foregoing respects the fossil associates itself with the Indian, and differs from the Java species. The comparison may, therefore, in general be confined to the former.

With the view of bringing at once under the eye, the discordance which occurs between the relative values of analogous dimensions, the subjoined table is here inserted. The modulus chosen is the space occupied by the seven molars, because on this measurement the development of the bones of the head must, to a certain extent, be dependent. The measurements given in Cuvier's Os. Fos. have afforded the proportions of the existing species; and the table of dimensions which closes this paper has given the proportions of the fossil.

Measurement.	Cuvier's Ind. Rhin.	Fossil. Ind. Rhin.
Space occupied by the seven molars assumed equal to, ...	1·00	1·00
Height of occiput from lowest edge of occipital foramen to summit of crest of occiput, ...	1·02	0·80
Greatest breadth of occiput, ...	1·11	1·05
Least thickness of cranium across temporals, ...	0·45	0.38
Breadth across at post orbital apophysis of frontals, ...	0.83	0·78
Distance from anterior of orbit to auditory foramen,.....	1·02	1·00
Breadth across the occipital condyles, ...	0·47	0·60

Referring to the table of dimensions it will be observed, that the height of the occiput is in the fossil less by met. 0.021 than the corresponding measure of Cuvier's Indian rhinoceros; but the greatest breadth of the occiput is met. 0.036 in favor of the fossil: relatively to the space occupied by the seven molars, these two measurements attain a less development in the fossil than in the existing animal.

The difference in the occipital condyles amounting to met. 0.065 in excess of the Indian rhinoceros causes a marked discordance in the ratios of these dimensions; but, as the left condyle and the adjacent parts are wanting in the fossil, the measure was obtained by doubling what appeared to be the exact half dimension; this of course is not so satisfactory as if the condyles had been perfect; any inaccuracy consequent on this circumstance could not, however, amount to a quantity which would materially alter the deduced proportion. The occiput, figs. 8, 9, Pl. XVII. is fortunately very perfect; from its dimensions, which prove it to have belonged to a smaller animal than the cranium of Pl. XV. may also be concluded, that though inferior in size to Cuvier's specimen of the Indian rhinoceros, which in greatest breadth of occiput exceeds it by met. 0.039, yet the space occupied by the condyles is 0.010 in favor of the small fossil occiput. In both of the fossils the depressions near the summits of the occiputs on each side of the mesial projections are deeper than those of the existing species.

The zygomatic arches not being entire, and the matrix being uncleared from the portions which remain, no particular remarks can be passed on them.

The sutures cannot anywhere be traced; a circumstance which precludes the notice of particulars frequently of importance in the comparison of species.

The least thickness of the cranium is but met. 0.001 greater than that of the Indian rhinoceros; and therefore in proportion to the modulus, yields a less ratio than that species.

The breadth at the orbits is met. 0.024 greater than in the existing species; consequently the skull does not in this part present any material discordance of proportion.

The length between the auditory foramen and the anterior of the orbit is 0.043 met. greater in the fossil; this measurement affords a proportion only differing met. 0.002 from that obtained from the existing species.

The infra-orbitary foramen is situated similarly to that of the Indian rhinoceros.

The nasal arch is massive and much developed; the spring of this arch is perpendicularly over the anterior of the second molar; that is a little more retired than in the Java or Indian rhinoceros skulls, given in Cuvier's Pl. 4.

The breadth of the palate has not been given in the table of dimensions, because the first and seventh molars not being perfect on both sides, measurements corresponding to those of Cuvier's could

not be obtained. It is comparatively less than in the existing species, but the great breadth of the teeth compensates for this difference.

Having detailed the essential differences and the points of resemblance observable in the fossil Indian rhinoceros when compared with CUVIER's dimensions of the existing Indian rhinoceros; we must be permitted to add, that additional measurements from skulls of the latter species are requisite before anything certain can be pronounced as to the amount of difference or correspondence between the two species. We are induced to make this remark, in consequence of having been favored with the examination of two craniums which presented considerable variation of proportions when compared with CUVIER's and with each other.

It appears to us desirable, therefore, to ascertain the limits within which individual variations range before any thing positive can be asserted. The foregoing remarks will have shown a great general resemblance, accompanied by a departure of proportions in some corresponding parts: the latter may be sufficient for the establishment of a new species,—at least for the present, until more data are obtainable whence to determine the bounds by which the individuals of one species are limited in their variations; for the sake of distinction, therefore, and present convenience, at the same time keeping in view the type to which it is a near approach, we have termed the species under consideration the *R. Indicus fossilis*.

Teeth. The remark has been already passed, that the greater number of fossils obtained from the Maginnud deposit are the remains of young animals: with the rhinoceros this has been particularly the case. We accordingly find ourselves better able to illustrate the early stage of dentition than that more advanced.

Fig. 1, Pl. XIX. represents the right half of an upper jaw, the left half being in this instance omitted, as also in figs. 3 and 4, in order that the series may be brought under the eye in one plate. Fig. 1 contains the four milk molars of the left maxillary; the fourth being but just cut is unworn; but the palate being broken away from the base of the tooth, more of it is seen than would otherwise be the case; in the right half of the specimen, where the palate is whole, the fourth molar is more concealed. The first molar is also unworn, but the second and third have suffered detrition. The two rows of teeth have their internal base lines parallel to each other, and the lines which would circumscribe their exterior much curved, in consequence of the difference of breadth which exists amongst the teeth. The upper part of an unworn tooth, measured exteriorly, is much longer than the lower; for the anterior of each molar projects beyond the posterior

extremity of the one immediately in its front by the gradual enlargement of the external line of enamel from the base to the summit. As the molars wear down, this outer development is reduced, the internal sides of the teeth come more into use, and breadth is gained in compensation for the diminished length of surface in wear.

Fig. 2, Pl. XIX. is a fragment from a right maxillary, containing the 1st, 2nd, and 3rd milk teeth, more worn than the corresponding molars of fig. 1. The 1st teeth in these two specimens are dissimilar; but that of fig. 1 not having completely disengaged itself from the jaw-bone, a strict comparison cannot be made between the two. The detrition which the remaining teeth have undergone does not prevent the trace of their enamel from being found to agree with that of the analogous molars of fig. 1.

A still further advanced state of wear is figured in fig. 3, which is taken from a cranium to which the occiput and anterior of the nasal bones are wanting. The 5th molar is here on the point of appearance; the four first are much worn, particularly the first and second; but there is no difficulty in tracing the correspondence between the molars of this and of the preceding specimens.

The above three exemplars of the deciduous dentition we assign to the fossil Indian rhinoceros, from the circumstance of their having been found in company with bones the forms of which clearly pointed out the species which they must have resembled. The disposition of the molars also corresponds with that observable in the cranium Pl. XV. where the same parallelism, of internal base line and arched external bounding line, exists. To which may be added, that the frontals of the cranium to which the molars of fig. 3 belong, evince no sign of having borne a horn.

Between the worn state of the deciduous molars exemplified by fig. 3, and the worn state of the permanent molars figured in Pl. XV. we have no connecting links, excepting such as may be obtained from a few detached teeth which appear to have belonged to this species—these are,

Fig. 5, Pl. XIX. The sixth molar from a left maxillary. The spur, which occupies no inconsiderable part of the hollow between the anterior and posterior transverse hillocks, is here less curved than that of the Indian rhinoceros; and there is wanting altogether the small salient of enamel, which in the Indian rhinoceros occurs between the starting point of the above mentioned spur and the point of junction of the exterior and anterior main lines of enamel. It may also be mentioned, that the exterior and posterior lines of enamel being less thick than the corresponding parts of the sixth molar of the Indian

rhinoceros, there is a greater space between the two. Such modifications of form are however fortuitous, differences of equal amount being observable in the teeth of animals of the same existing species.

This fossil measures in length, in. 2.50 met. 0.0645
in breadth, „ 2.62 „ 0.0675

Fig. 6. The 5th molar, derived from a left maxillary. The outline of its enamel accords with that of the similar tooth of the Indian rhinoceros, the only difference being in the dimensions and in the enamellated edge of the short beading at the anterior side of the tooth.

It measures in length, in. 2.08 met. 0.053
in breadth, „ 3.27 „ 0.0835

Fig. 7, is the 7th molar, and from a right maxillary; the point of the small spur is broken, as also the anterior extremity of the external line of enamel; but the tooth is sufficiently perfect to show a close resemblance to the analogous molar of the Indian rhinoceros.

It measures in length, in. 2.88 met. 0.0735
in breadth, „ 2.53 „ 0.065

Fig. 8, is the 7th molar of a left maxillary; the difference observable between this and the foregoing specimen consists in the great development which the small anterior spur here attains; in the former it is scarcely observable; in fig. 8 it is very prominent. Variations to an equal amount may, however, be observed in the minor saliants, &c. of enamel in teeth appertaining to skulls of the same existing species. No weight can therefore be attached to such unimportant modifications.

This fossil measures in length, in. 2.95 met. 0.075
in breadth, „ 2.55 „ 0.065

Fig. 5, offers a good example of the difference of length at the upper and lower parts of the tooth; the greatest length, which is that taken near the top, is given above; the least external length taken at the base would have been in. 2.04, or nearly half an inch less than the top measurement.

The cranium Pl. XV. has its molar teeth so much worn down, that the configurations of the enamel cannot be traced; the table of dimensions gives the length and breadth of each tooth, and shows that although the lengths do not materially differ from those of the corresponding teeth of the existing species, the breadths exceed those of any hitherto described.

Without complete illustrations of the milk-teeth of existing species, it would be dangerous to attempt a comparison between them and the fossil Indian rhinoceros. We have therefore avoided the endeavour;

but we must be allowed to notice the upper jaw fig. 4, Pl. XIX. which offers peculiarities when compared with figs. 1, 2, and 3 (of the same plate) deserving of remark.

The right half of the specimen is figured in the plate, the left half having lost the 1st tooth. With respect to age, this jaw nearly corresponds with fig. 3, the fifth molar being in both on the point of appearance. The following departures from the tracing of enamel in figs. 1, 2, and 3, may, however, be observed. The second molar of fig. 4 has this peculiarity,—that instead of the anterior portion of the tooth being one continuous offset from the exterior line of enamel, it only assumes that appearance after considerable detrition, consisting at first of a short offset and an isolated pillar, as shown in the drawing. The two sides of the jaw have been very unequally worn, in consequence of which the opposite side to that delineated has the pillar and offset conjoined. The third molar also presents a marked difference, when placed in juxta-position with the corresponding teeth of the other three jaws; the two spurs which occupy the central hollow of the tooth are of a different shape from that which occurs in the other specimens. In other respects fig. 4 corresponds with them—its rows of molars are parallel to each other, and the dimensions offer but trifling variations. The modifications of form above alluded to, unless fortuitous, which is perhaps improbable, denote the existence of another species; a fact corroborated by the examination of the milk molars of the lower jaws in our possession. Upon the consideration of these we now enter, but are able to offer but few and unsatisfactory remarks.

Lower Jaws. With the exception of the fine fragment, fig. 6, Pl. XVI. submitted to our inspection by Conductor Dawe, and the fragment fig. 9, the specimens of lower jaws are all from the Maginnud deposit, and all the remains of young animals.

Fig. 1, Pl. XVI. represents a fossil which has lost the anterior of its symphysis, the second molar on the right, and the first molar on the left side of the jaw; as also both the rami, which are broken off. Four molars have appeared, the second and third of which are worn, but the first and fourth have their enamel intact; the sections of fracture expose germ teeth. The two lines of molars have a gentle convergence, which is effected, not by a curve in the rows of teeth, for these are set in a perfectly straight line, but by the gradual approach of the two rows, which make a small angle with the medial line of the jaw. The section shown by the break of the symphysis and the interval between the front molars, argues the existence of a prolonged symphysis. The fourth molar is characteristic, having an isolated point or low pillar in the centre of the chord of its posterior crescent.

Fig. 5 is a fragment containing two molars, apparently the third and fourth milk ones; the outer enamel of the latter is mutilated, but the interior is perfect, and presents the isolated pillar of the posterior crescent, noticed as remarkable in fig. 1.

Fig. 4 is the right half of the lower jaw of a young rhinoceros, but of one somewhat older than the animal to which fig. 1 belonged, for the fourth molar has in fig. 4 suffered detrition. Notwithstanding the difference of age being in the favor of this specimen, the space occupied by the four molars is less than that of the four in fig. 1. The fourth molar is here devoid of the low isolated pillar in the posterior crescent, and has the central enamel, or junction of the two crescents, larger than in fig. 1. There are no means of ascertaining whether or not the opposite rows of molars were parallel, but in position of symphysis and set of the teeth in a perfectly straight line, this specimen corresponds with the foregoing.

Fig. 3 is the exterior view of fig. 4.

Fig. 2 has its fourth molar just disclosed and rising into the line of molars: it is devoid of the isolated pillar; but in size corresponds with fig. 1, instead of fig. 3, to which latter it assimilates itself by the fourth and second molars.

It is difficult to ascertain the degree of importance to be attached to such points of difference: in no specimen from the jaw of an adult animal has any trace of the isolated pillar been hitherto found: occurring as this peculiarity does in a deciduous tooth, should nothing similar take place in the permanent tooth which replaces it, the only chance of determining the question will be the discovery of an entire head. We have noticed an upper jaw, fig. 4, Pl. XIX, which indicates the probability of the existence of two species. The examination of the above lower jaws rather confirms this supposition; but in the event of such slight modifications denoting specific distinctions, we are unable, in consequence of the paucity and incompleteness of specimens, to decide which are the milk-teeth of the fossil Indian rhinoceros. Nor are we fortunate with respect to the lower maxillary of the adult animal; figs. 6, 7, and figs. 8, 9, being all that we can bring forward. The sections of these two fragments differ in consequence of their being derived one from the posterior, the other from the anterior part of the jaw, which thickens as it approaches to the symphysis. These two specimens resemble the corresponding portions of the lower jaw of the Indian rhinoceros, but are too imperfect to afford any satisfactory measurements for grounds of comparison.

Anterior Extremity.

A scapula in our possession is not sufficiently perfect to give accu-

rate measurements, but it bears as great a general resemblance to that of the Indian rhinoceros as do the other parts of the skeleton.

The humerus, figs. 1, 2, Pl. XVII, having its radius and ulna attached, was discovered by ourselves very close to the place whence we excavated the femur and tibia forming the subject of Pl. XVIII. With the exception of the deltoid crest, this humerus is perfect, and has afforded the dimensions which enter into the first column of the table. For the purpose of comparison the following five columns are here added. The proportions of the Indian and Sumatra small species of rhinoceros are deduced from Cuvier's table; those of the fossil specimens are of course from the table of dimensions. The length of the bone is assumed as the unit, and the measures of other parts referred to it in order to obtain their comparative values.

Measurements.	Cuvier's Ind. Rhin.	Cuvier's Sumatra Sl. Sp. Rhin.	Fig. 1, Pl. 17. fossil I. R.	Fig. 5, Pl. 17. fossil Ind. Rhin.	Fig. 6, Pl. 17. fossil Ind. Rhin.
Length of humerus from tuberosity to external condyle,	1·00	1·00	1·00	1·00	1·00
Ditto ditto ditto internal ditto,	1·03	0·95	0·91	0·94	..
Greatest anter. post. diameter at top,	0.44	0·30	..	0·44	0·43
Breadth across condyles,	0·36	0·31	0·35	0.37	..
Ditto of articulating pully,	0·25	0·19	0·22	0·22	0·25
Least diam. of the body of the humerus,	0·15	0·13	0·14	..	0·15
Length of radius,	0·79	0·75	0.76	..	..
Breadth at top,	0·26	0·20	0.23	..	..
Ditto at bottom,	0·25	0·18	0.23	..	..
Length from articulating head to bottom of internal condyle,	..	..	0.82	0·81	0·87

The Sumatra rhinoceros (small species) concurs with the fossil Indian rhinoceros in having the length taken to the external condyle longer than that taken to the internal. The Javanese and the larger Sumatra species also accord with the fossil in this respect, but not so nearly as the small Sumatra species, which has consequently been introduced into the above table.

The length of the fossil humerus, figs. 1, 2, Pl. XVII, exceeds that of any of the existing species: its thickness is, in proportion to the length of the bone, intermediate between the Sumatra and Indian species. The articulating pully also possesses a development intermediate in value to those of the two existing species. The breadth at the condyles is in the same proportion or nearly so as that of the Indian rhinoceros. The radius is in length, considered with reference to length of femur, a little less than in the Indian and somewhat in excess of the small Sumatra species; the remaining two dimensions of this bone yield values intermediate to those of the two existing rhinoceroses. These remarks apply to the deductions for fig. 1; nor would it

be necessary much to alter them in speaking of fig. 5 ; but fig. 6 presents such a close approximation to the Indian rhinoceros, that it is much to be wished that the specimen had not been so broken as to prevent additional measurements from being derived from it. Excepting in the length from the articulating head to the bottom of the internal condyle, it does not much differ from fig. 5. The bone, however, being imperfect, must be omitted in drawing a comparison between the fossil and existing species.

Fig. 1, varies most from the Indian rhinoceros in the proportion of the length taken to the internal condyle ; an anomaly difficult of explanation. We must here repeat, that there exists a necessity for a greater number of tables of dimensions taken from the skeletons of the Indian rhinoceros : the anterior extremity of a rhinoceros, with the examination of which we have been favored, yielded proportions so nearly corresponding with those deduced from the fossil humerus, figs. 1, 2, as to prevent our drawing more positive conclusions than those expressed at the close of the remarks on the cranium, Pl. XV.

Posterior Extremity.

The femur and tibia, Pl. XVIII, were dug up in such close proximity to the humerus and radius, fig. 1, Pl. XVII, that little doubt could be entertained of their having belonged to the same animal. Being perfect,

Measurements.	Cuvier's Ind. Rhin.	Fossil Pl. 18.	Fossil 3d in table of dimensions.	Fossil 5th in table of dimensions.
Length of femur from articulating head to bottom of internal condyle,	1·00	1·00	1·00	1·00
Breadth from head to most salient part of great trochanter,	0·38	0·43	..	..
Breadth across condyles,	0·29	0·28	0·26	..
Antero. post. diam. of internal condyle,	0·34	0·34	..	..
Ditto ditto ditto of external ditto,	0·27	0·26	..	..
Distance between bottom of 3rd trochanter and top of 1st,	0·59	0·61	..	..
Ditto ditto ditto small trochanter and top of head of femur,	0·46	0·41	0·46	0·42
Diam. of articulating head of femur,	0·18	0·19	0·16	0·17
From lower side 3rd trochanter to bottom of external condyle,	..	0·38	0·38	..
Length of femur from articulating head to bottom of 3rd trochanter,	..	0·72	0·71	0·64
Length of tibia from anter. tubero. to anter. edge of inferior articulating surface,	0·67	0·70	..	..
Greatest transverse diam. at top,	0·25	0·25	..	..
Antero. post. diam. from antero. post. tubero. to post. ext. of internal condyle,	0·29	0·31	..	..
Transverse diam. at bottom,	0·21	0·20	..	..
Diam. antero. post. of internal side,	0·14	0·13	..	..
Length of fibula,	0·62	0·65	..	..
Breadth at bottom,	0·10	0·10	..	.

except at the lower part of the great trochanter, the specimen affords ample means of comparison with the femur of the existing species.

On reverting to the table of dimensions it will be observed, that this fossil exceeds, as did also the humerus, any of those in Cuvier's table of existing species. The preceding columns show in what respects the proportions of the bone vary from those deduced from Cuvier's Indian rhinoceros. The length of the femur is here the modulus.

From a comparison of the two first columns in the above table there results, that the fossil has a greater development at its upper and a somewhat less development at its lower extremity than is the case in the Indian rhinoceros. The third trochanter is set lower down, and the inferior extremity of the small trochanter higher up than in the existing species; the articulating head is larger in proportion in the fossil than in the Indian rhinoceros. None of these modifications however are excessive; on the contrary, they are less than those which exist amongst the fossils themselves, which are all three undoubtedly of the same species.

From the manner in which the lower and exterior part of the great trochanter is broken, there is every probability that a descending point protruded from the fractured surface towards the third trochanter, the ascending point of which is very perfect.

The third trochanter, however, differs from that of the existing species as figured in Cuvier's *Oss. Foss.* in not possessing the double point; for it has a single well defined ascending process, without any sign of the bicuspid termination. The lower edge of this trochanter, instead of ascending with a gradual swell towards the point, as in the existing species, has a counter curvature to that of the upper edge. The chief dissimilarity between Cuvier's plate and the fossil occurs in this part of the bone, the third trochanter assuming a different shape, and offering a variation more distinctive than any other presented in either extremity. This circumstance, together with some of the proportions of the cranium, has led us for the present to distinguish these remains by appending the word fossil to the name of that species of which they are the prototype: but we dwell on the necessity of more extended research, and the collection of a greater series of tables of dimensions of the Indian rhinoceros, before any thing absolutely conclusive can be pronounced with regard to the fossil and existing species.

We have had no hesitation in ascribing the two limbs dug up in such close neighbourhood to the same animal; an additional confirmation of the correctness of the assumption may be derived from the proportion which exists between these two extremities, when compared with that which occurs in the Indian rhinoceros.

Ind. Rhin. femur and tibia, met. 0.960 humerus and radius, met. 0.868
Fossil Ind. Rhin. do. do. „ 1.056 ditto do. „ 0.947

In the first, the humerus and radius are to the femur and tibia in the ratio of 1 : 1·10 ; in the fossil the ratio is 1 : 1·11.

The analogy which exists between these fossil extremities and those of the Indian rhinoceros being no less striking than that which was observed between the cranium Pl. XV. and the skull of the existing species, we have considered such correspondence sufficient to prove, that the fossil anterior and posterior limbs appertained to an animal of the same species, and of about similar size to the one of which the cranium in question is a relic.

Even in the event of a much closer approximation of symmetrical proportions than that given in this paper being obtained, we are aware that identity of species could not be presumed. It could not be assumed that the skin, the external appearance of the animal, was precisely similar to that of the existing species. The fossil Indian rhinoceros must, however, have presented a figure bearing a strong general resemblance to the uncouth symmetry of its present representative.

Remarks on part of the specimens delineated in Plate XVII.

When describing the specimens of upper and lower jaws, the possibility of the existence of another species was noted. The fossil femur, of which figs. 3, 4 are representations, would be corroborative of the fact, were it not for a peculiarity which renders it somewhat doubtful whether or not it may be attributed to a species of rhinoceros. On comparing it with Pl. XVIII, the dissimilarity of the two bones will be at once apparent. The third trochanter is in fig. 3, placed about the centre of the femur, in which respect it resembles the unicorn of Java, thus described by Cuvier : " Le femur à son troisieme trochanter placé au milieu de son côte externe, large, recourbé en avant, ne remontant pas de sa pointe vers le grand trochanter lequel ne donne non plus aucune pointe pour venir à sa rencontre. L'echancrure entre eux n'est donc pas close en dehors ; mais du reste elle est aussi grande que dans l'unicorne. La tête inferieure est plus enlargée en arriere." The latter remark, however, does not at all apply to the fossil, which has its inferior extremity much compressed instead of developed ; so much so, indeed, that but for the other parts of the bone it could not for a moment be a matter of doubt whether or not it came from a rhinoceros.

Figs. 10, 11. Axis of a rhinoceros: the spinous process appears shorter and deeper than the one figured by Cuvier, and the main foramen more regularly circular.

Figs. 12, 13. A calcaneum which appears not to differ from that of the existing species.

Fig. 14. Tarsus and metatarsus. In this specimen the medial metatarsal bone is not so long as that of the Indian rhinoceros, but longer than that of any other species given by Cuvier. The general form corresponds with that in Cuvier's plate.

Fig. 15. Metacarpal bones: the medial one is rather longer than the same bone in the Cape rhinoceros, and considerably longer than in any other species.

Figs. 16, 17, are the external metacarpal of the left side.

Fig. 18. An astragal, which differs much from those figured by Cuvier, being higher, narrower, and more compressed.

Fig. 19. Tarsal and metatarsal bones of a rhinoceros, with the lower portion of tibia attached.

Table of Dimensions.

Measurements of the head.	Cranium. Pl. XV.		Occiput. Pl. XVII.	
	Met.	In.	Met.	In.
Height of occiput from lowest edge of occipital foramen to top of crest,	0·259	10·20	0·223	8·78
Greatest breadth of occiput, behind auditory foramen,	0·341	13·44	0·266	10·50
Least thickness of cranium at temporal bones,	0·126	4·95	..	..
Breadth between post orbital apophysis of frontals,	0·254	10·00	..	..
Distance from anterior of orbit to auditory foramen,	0·325	12·80	..	..
Space occupied by the seven molares,	0·324	12·75	..	..
Breadth across occipital condyles,	0·195	7·70	0·140	5·51
Ditto of occipital foramen,	..	..	0·0575	2·25
Height of ditto ditto,	..	..	0·049	1·90
Distance between internal extremities of glenoid facets of temporal,	..	..	0·0735	2·88
Ditto from lower edge of occipital foramen to medial post. extremity of palate,	0·368	14·50	..	..
Ditto from post. of right occipital condyle to spring of nasal arch,	0·539	21·22	..	..
Ditto ditto ditto to anterior of orbit,	0·449	17·71	..	..
Depth from edge of maxillary at 5th molar to upper surface of frontals,	0·239	9·42	..	..
Greatest transverse width of nasals at horn site,	0·174	6·86	..	..
Ditto external breadth at 6th molar,	0·246	9·72	..	..
Thickness of cranium over the medial post. extremity of palate,	0·204	8·06	..	..
Height of highest point of nasal arch above anterior of palate,	0·238	9·38	..	..
Perpendicular from a line tangential to the summit of crest and vertex of nasal arch to the depression of frontals,	0·099	3·91	..	..

Measurements of Upper Molars.	Cranium. Pl. XV.		Cranium. Fig. 3 Pl. XIX.		Fig. 1. Pl. XIX.		Fig. 2. Pl. XIX.		Fig. 4. Pl. XIX.	
	Met.	In.	Met.	In.	Met.	In.	Met.	In.	Met.	In.
Greatest length										
Molar, 1	..	..	.030	1.19	.0295	1.14	.030	1.20	..	..
2	.035	1.36	.034	1.335	.038	1.49	.0395	1.53	.039	1.49
3	.045	1.75	.0475	1.85	.053	2.07	.056	2.17	.045	1.74
4	.049	1.92	.058	2.26	.061	2.39	..	..	.056	2.20
5	.044	1.69	.061	2.37	..	..	..	..	..	..
6	.0495	1.95	..	..	..	..	..	..	..	..
7	.0755	2.96	..	..	..	..	..	..	..	..
Greatest breadth										
Molar, 1	..	..	.024	0.95	.024	0.95	.0285	1.09	..	..
2	.059	2.31	.0385	1.5	.036	1.40	.041	1.58	.037	1.45
3	.080	3.15	.049	1.9	.045	1.88	.053	2.05	.051	2.007
4	.083	3.36	.0575	2.25	..	..	..	..	.059	2.30
5	.081	3.19	..	..	..	..	..	..	..	..
6	.089	3.48	..	..	..	..	..	..	..	..
7	.083	3.25	..	..	..	..	..	..	..	..

Measurements of Lower Molars.		Fig. 1. Pl. XVI.		Fig. 2. Pl. XVI.		Fig. 3. Pl. XVI.	
		Met.	In.	Met.	In.	Met.	In.
Greatest length of Molar, ...	1	.016	0.61	..	..	.017	0.67
	2	.037	1.44	.0335	1.30	.033	1.29
	3	.053	2.09	.050	1.98	.0425	1.67
	4	.047	1.82	.056	2.18	.046	1.79
	5	..	..	..	..	..	..
	6	..	..	..	..	..	..
	7	..	..	..	..	..	..
Greatest breadth of Molar, ...	1	..	..	..	..	.0115	0.46
	2	.020	0.77	.021	0.81	.018	0.70
	3	.026	1.01	.027	1.05	.025	0.98
	4	.029	1.12	.029	1.10	.030	1.19
	5	..	..	..	..	..	..
	6	..	..	..	..	..	..
	7	..	..	..	..	..	..

Measurements of Anterior Extremity.	Fig. 1. Pl. XVII.		Fig. 5. Pl. XVII.		Fig. 6. Pl. XVII.		Fossil humerus not drawn.		Fossil humerus not dwn.	
	Mt.	In.	Mt.	In.	Mt.	In.	Mt.	In.	Mt.	In.
Length of humerus from tub. to external condyle,.....	.538	21.20	.488	19.22	.482	19.0	..	..	..	..
Do. do. do. internal do.....	.492	19.38	.461	18.15	..	..	..	..	..	..
Greatest anter. post. diam. at top,.....	..	..	.218	8.60	.208	8.20	.200	7.90	..	..
Breadth across condyles, ...	.193	7.60	.183	7.22	..	..	..	..	.176	6.94
Breadth of the articulating pully,...	.119	4.70	.111	4.40	.121	4.80	.104	4.10	.109	4.30
Least diam. of the body of the humerus, ...	.078	3.07	..	..	.073	2.90	.071	2.82	.069	2.75
Length of the radius,.....	.409	16.10	..	..	..	..	..	..	..	..
Breadth at top,.....	.124	4.90	..	..	..	..	..	..	..	..
Ditto at bottom, ...	.124	4.90	..	..	..	..	..	..	..	..
Length of humerus from art. head to internal condyle, ..	.441	17.40	.393	15.51	.420	16.55	.389	15.35	.398	1570

Measurements of Posterior Extremity.	Femur&c. Pl.XVIII		Fossil femur not drawn.		Fossil femur not drawn.		Figs. 3 and 4 Pl.XVII.		Fossil femur not drawn.		Fossil femur not drawn.	
	Mt.	In.	Mt.	In.	Mt.	In.	Mt.	In.	Mt.	In.	Mt.	In.
Length of femur from ant. head to bottom of 3rd trochanter,	.449	17.70	..	..	.383	15.10	..	..	.328	12.94	.369	14.56
Length of femur from ant. head to bottom of internal condyle,	.621	24.45	..	..	.539	21.25	..	..	.510	20.10	..	..
Breadth from head to most salient part of great trochanter,	.269	10.60	..	..	..	..	..	..	..	..	..	..
Breadth across condyles,	.173	6.82	..	..	.143	5.63	.146	5.75	..	..	..	..
Antero. post. diam. of internal condyle,	.214	8.45	.221	8.70	..	..	.166	6.55	..	..	..	..
Ditto do. do. external condyle,	.161	6.35	.162	6.40	..	..	.139	5.48	..	..	..	..
Distance between bottom of 3rd trochanter and top of first,	.383	15.10	..	..	..	..	..	..	..	..	..	..
Distance between bottom of small trochanter and top of head of femur,	.259	10.20	..	..	.249	9.80	..	..	.215	8.50	.231	9.10
Diam. of articul. head of femur,	.118	4.65	..	..	.086	3.40	..	..	.089	3.50	.083	3.30
From lower side 3rd trochanter to bottom of external condyle,	.242	9.53	.177	7.00	.208	8.20	.266	10.50	..	..	..	..
Length of tibia from anter. tubero. to anter. edge of infer. articu. surface,	.435	17.15	..	..	..	..	..	..	..	..	..	..
Greatest transverse diam. at top,	.156	6.15	..	..	..	..	..	..	..	..	..	..
Antero. post. diam. from anter. tub. to post. ext. of internal condyle,	.195	7.70	..	..	..	..	..	..	..	..	..	..
Transverse diam. at bottom,	.128	5.05	..	..	..	..	..	..	..	..	..	..
Diam. of antero. post. internal side,	.086	3.40	..	..	..	..	..	..	..	..	..	..
Length of fibula,	.405	15.95	..	..	..	..	..	..	..	..	..	..
Breadth at bottom,	.064	2.54	..	..	..	..	..	..	..	..	..	..

Index to the Plates referred to in this paper ; shewing also their orders of succession.

Pl. XV. Three views of fossil cranium, (on lithographed paper.)

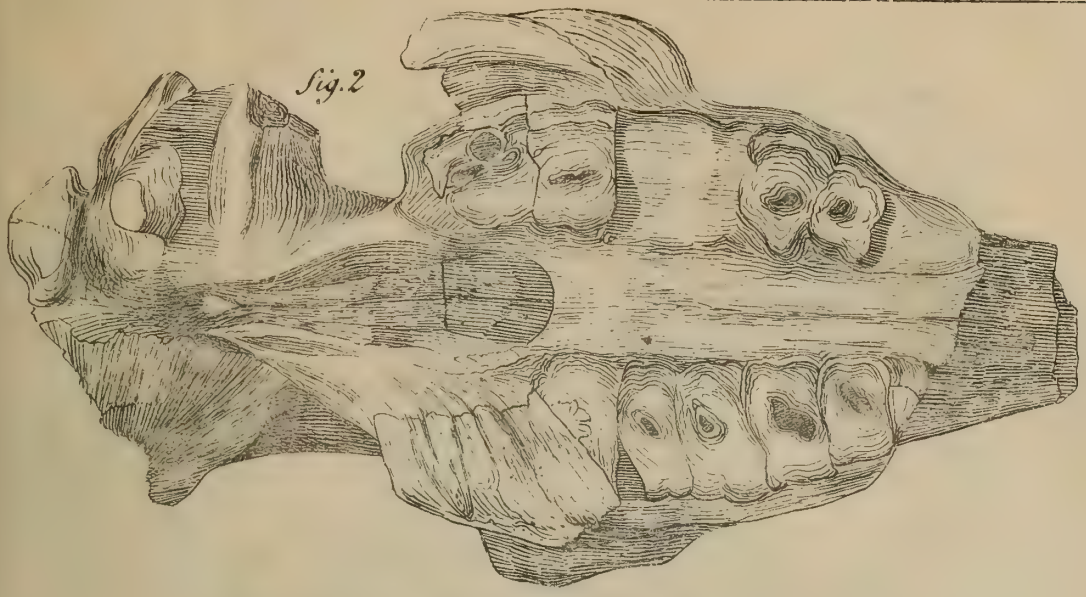
Pl. XIX. Views of connected and detached molars upper jaw, (copper plate.)

Pl. XVI. Ditto fragments from lower jaws, (lithographed paper.)

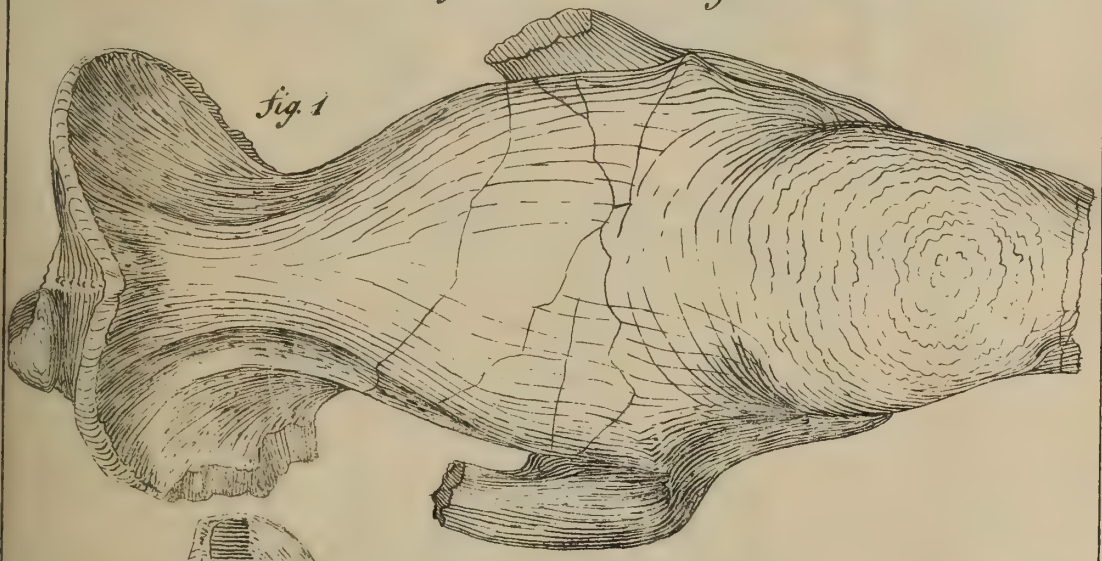
Pl. XVIII. Three views of femur and tibia.

Pl. XVII. A folding plate on lithographed paper, sundry bones of the extremities.

[The letters appended to the plates for convenience of reference in the MS. ; namely, A, B, C, D, E, F, have been changed in printing into Nos. XVIII, XVII, XV, XIX, and XVI. Plate F was, as before stated, spoiled in transferring it to the stone. By mistake the dimensions in Pl. XV, have been marked *one-fourth* in lieu of *one-sixth ;* a material error, which it is as well to notice thus prominently.—Ed.]

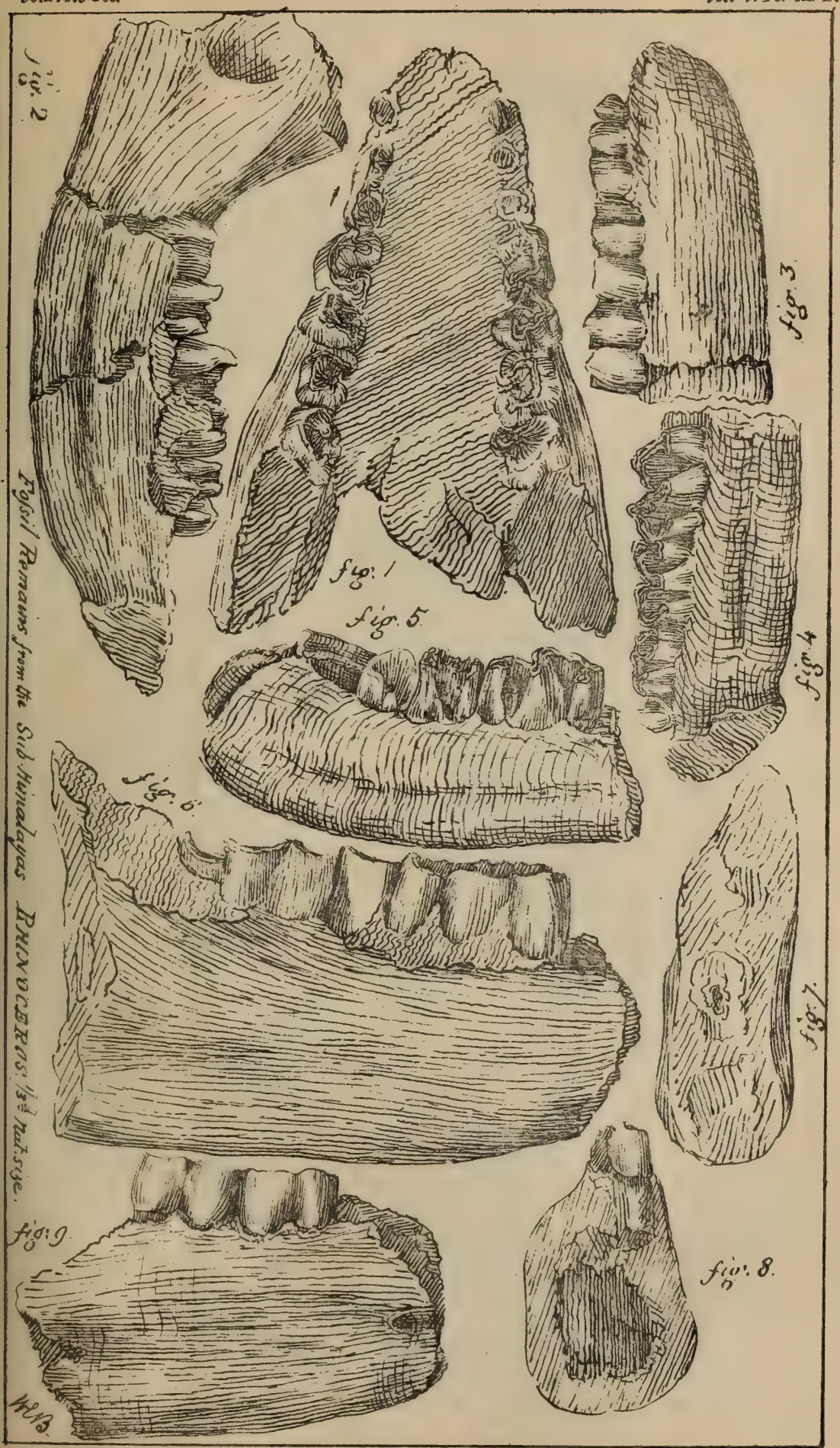


Fossil remains from the Sub Himalayas Rhinoceros

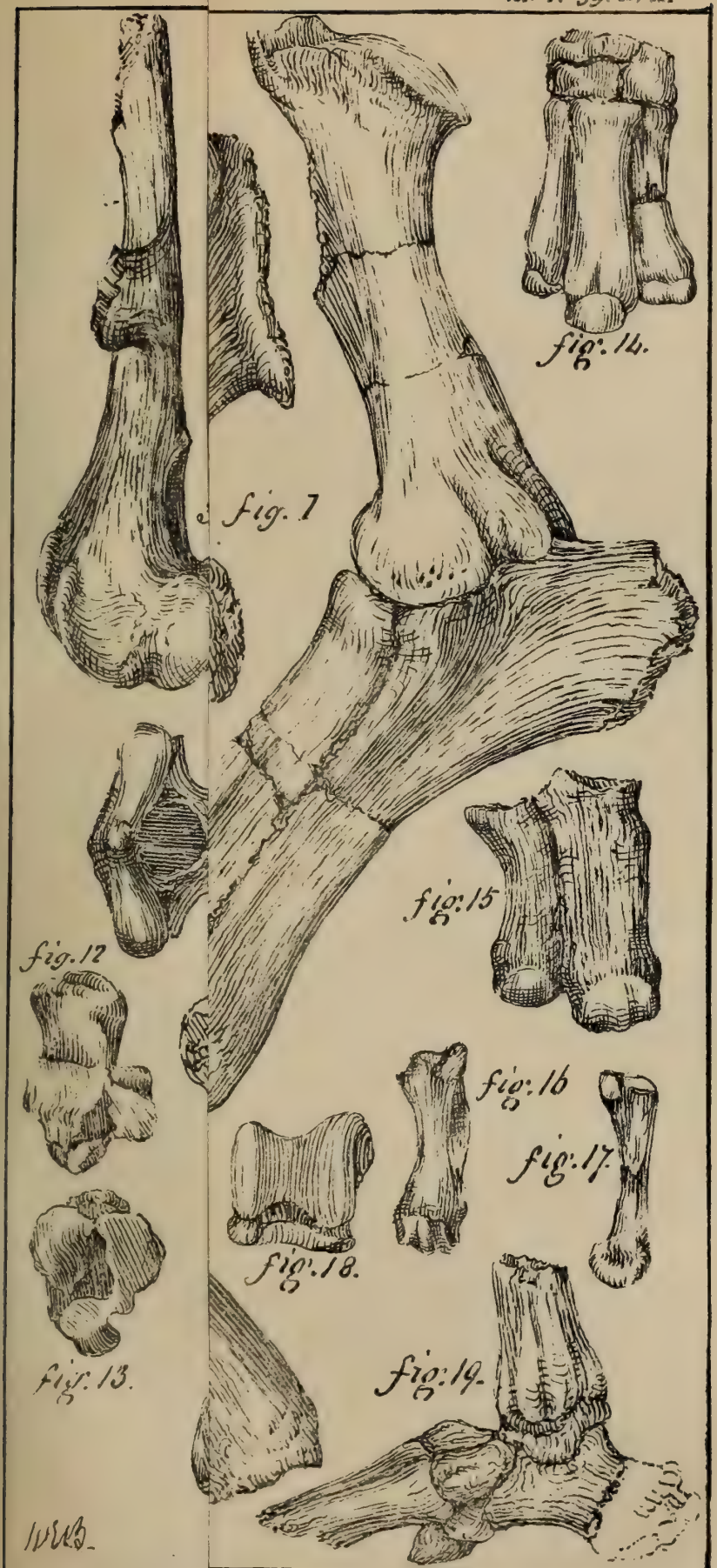


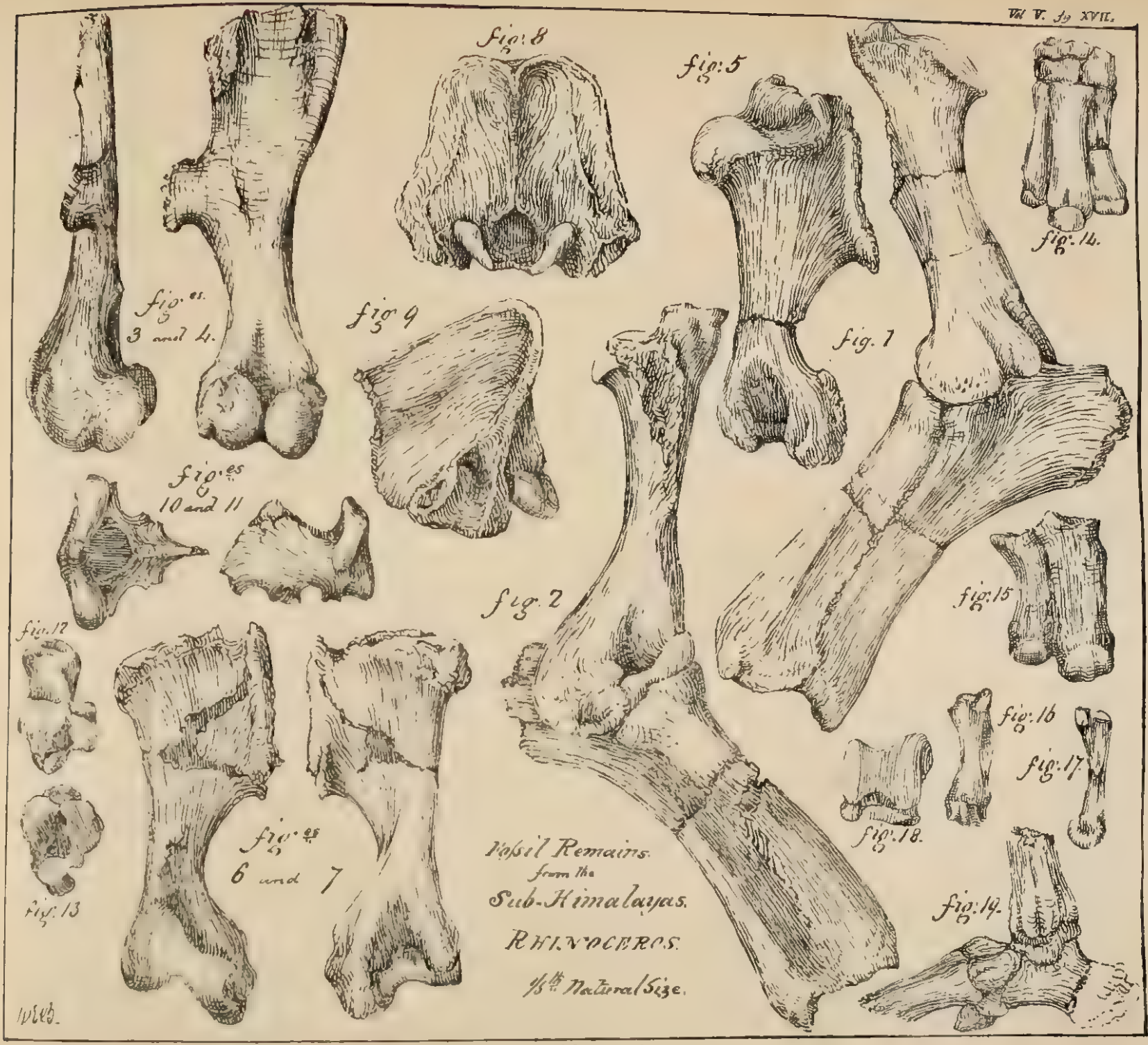


J.B. Tassin's Lith. Press Calcutta.

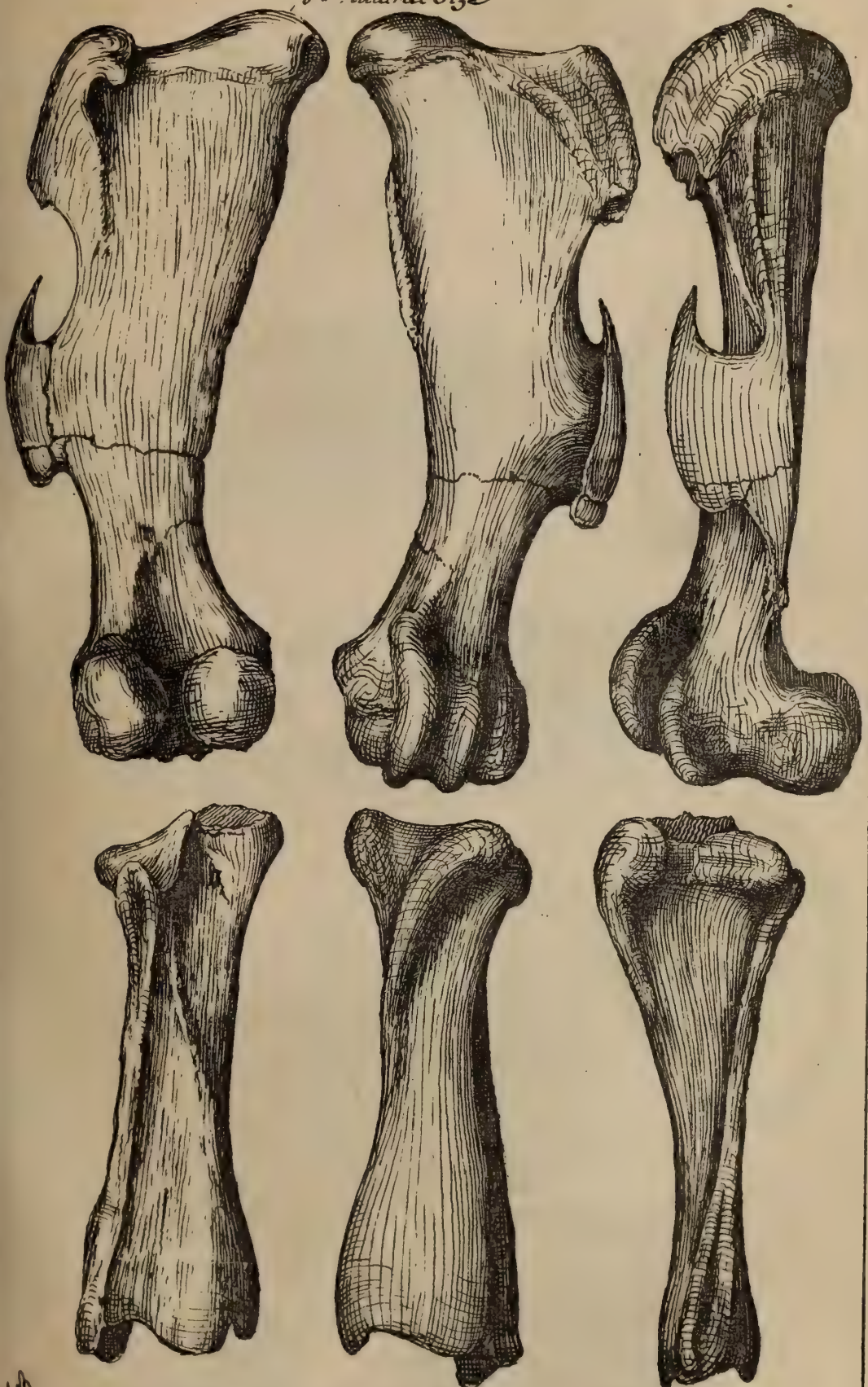


Fossil Remains from the Sub-himalayas RHINOCEROS. 1/3rd nat.sze.


fig. 14.
fig. 7
fig. 15
fig. 12
fig. 16
fig. 17
fig. 18.
fig. 13.
fig. 19.
WWB.

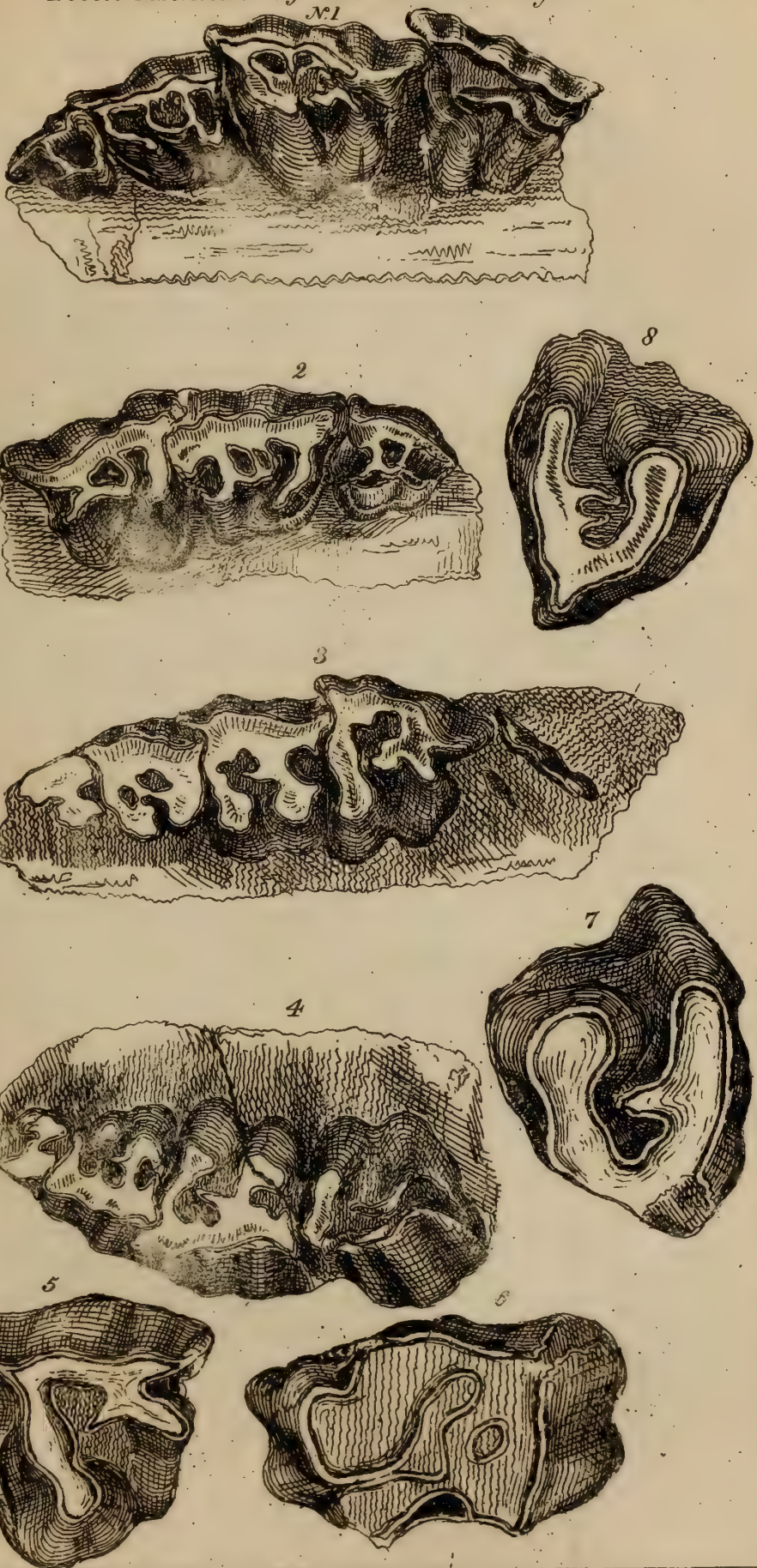


J. B. Tassin's Lith: Press - Calcutta.



Fossil Remains from the Sub-Himalayas. RHINOCEROS

Fossil Rhinoceros of the Sub-Himalayas.



Durand des. et Soc.



V.—*Note on the States of Pérak, Srímenánti, and other States in the Malay Peninsula. By* T. J. Newbold, *Lieut., A. D. C. to Brigadier General* Wilson, *C. B.*

Pe'rak.

Pérak is separated on its northern frontier, from *Quédah* by the *Krian* river, which debouches into the Straits of Malacca, in about 5° 10′ North. On the south it is divided from the piratical state of *Salangore*, by a river of inconsiderable magnitude called the *Runkúp*, which lies a little to the north of the *Bernam* river, in about 3° 59′ north; interiorly, by the chain of primitive mountains, that run down the centre of the Malay peninsula to *Point Romania* near *Singapore*, from the states of *Tringánu* and *Pahàng* on the opposite coast. According to Captain Glass, the territory under the sway of the *Pérak* chief extended about 50 leagues inland: its length along the coast is upwards of 120 miles.

The principal town is situated a considerable distance up the *Pérak* river, which is one of the largest and most rapid of the streams of the peninsula that flow into the Straits of Malacca: according to Anderson, it will admit vessels drawing 12 feet. The channel, however, is tortuous and intricate. The banks are generally covered with jungle, having but a few villages at considerable distances. The places of most note are *Kota Lúmut*, *Bander*, *Pantong Panjang*, and *Pássir Gáram*, about 30 miles up the river. The chief generally resides at *Pássir Suyóng* or *Pássir Pulye;* places about three or four days' pull from the mouth. It has been stated to me by natives, that there are several stockades commanding the approach by water to these places.

Produce.—The principal products of this state are tin, rice, and ratans. The present produce of tin is about 8,500 *picals* annually: this goes for the most part to the *Pinang* market: latterly some of it has found its way to *Singapore*. Mr. Anderson states, that the Rája Mu'da and Tuanku Hassin, sons of the late chief, Taj-uddin, established posts a few years ago, about 30 miles from the river's mouth, where they levied a duty on all tin exported. These posts have since been abandoned. The chief himself derives most of his revenue from a toll on the tin produced: so much, it is said, as from four to six dollars per *bhar* of 3 *piculs*. The Dutch enjoyed, for upwards of a century and a half, during their sway at Malacca, the monopoly of the tin. They had a factory at *Tanjong Puttús* on the river, and a small fort on the harbour between the Dinding Islands and the main. The cultivation of rice has, of late years, been on the increase. I was assured, by some respectable *Pérak* traders, that more than sufficient for home consumption was now grown.

Population.—The population of *Pérak* is roughly calculated at 35,000 Malays, professing the Mahomedan religion, not including the aboriginal tribes; a few Chinese, Arab and *Chuliah* (Malabar ?) settlers.

History and Government.—*Pérak* was formerly tributary to the Malayan sovereigns of Malacca, and afterwards to those of the kingdom of Achin. Since the decline of the latter, however, it has become in some measure independent; although Siam has, at various periods, asserted her claims to sovereignty, and demanded tribute. In consequence of the spirited resistance of the late chief, Taj-uddin, to these arrogant and groundless assumptions, *Pérak* was overrun in 1818 by the troops of the Rája of *Qúedah*, who had invaded it by order of the king of Siam. In 1822 the Siamese were expelled, and the rightful chief restored, by the powerful assistance of the late warlike chief of *Salangore*, Rája Ibrahim.

The government is despotic. *Pérak* has been ruled during the last three centuries by a race of chiefs, under the title of *Sultan*, who were connected with the ruling dynasties in *Johóre* and *Achin*. Under the *Sultan* are five officers of state, forming a deliberative council, viz :— the *Bandahára*, *Tumungong*, Rája *Múda*, *Mantri*, and *O'rang Káya Besár*. Besides these there are six *Panghúlús* over the six *Bongsas (Vansas)* or classes, into which the people are divided.

The succession to the throne is generally hereditary. *Sultan* Mansu'r Sha'h II, who died in 1818, was succeeded by his son Taj-uddin, who died about four years ago. His nephew, the present chief, Rája Cho'lán, succeeded.

Political and Commercial relations with the British Government.—In 1818 a treaty of commercial alliance was concluded by the British Commissioner, Mr. Cracroft, on the part of the Company, with the then Rája of *Pérak*, *Sultan* Mansu'r Sháh, chiefly with the view of preventing the monopoly of the tin trade by the Dutch, who were, at that time, about to resume possession of Malacca. This treaty provided against the monopoly, and secured to British merchants the privilege of being allowed to trade on equally favorable terms with *Pérak* as any other nation.

By Major Burney's treaty with *Siam* in 1826, it was agreed that the Rája of *Pérak* should govern his country according to his own will; should he desire to send the gold and silver flowers to *Siam*, as heretofore, the English would not prevent him. That if *Chow Phyá*, of *Ligore*, desire to send down to *Pérak*, with friendly intentions, forty or fifty men, whether Siamese, Chinese or other Asiatic subjects of Siam, or if the Rája of *Pérak* desire to send any of his ministers or officers to seek *Chow Phyá* of *Ligore*, the English should not forbid

them. That no force should be sent by either nation to go and molest, attack or disturb *Pérak*. The English engaged not to allow the state of *Salangore* to attack or disturb *Pérak;* and the Siamese, in turn, engaged not to go and attack or disturb *Salangore*.

The Siamese also stipulated in this treaty, that the present ex-king of *Qúedah* should not be permitted to live at Prince of Wales' Island or *Prye*, or in *Pérak, Salangore*, or any Burmese country.

Sri'menánti.

Srímenánti, though formerly considered as subordinate to *Johóle*, asserts her independence, and has tacitly assumed a place among the four elective states, though her claims are not distinctly recognized. The *Panghúlús* of *Srímenánti*, not being descended from the nine to whom titles were given by the Sultan of *Johóre*, assumed by the sanction of the *Panghúlú* of *Johóle*, that of *Sétia Mahárája*. Since this, seven *Panghúlús* have ruled in *Srímenánti*, the six last of whom were *Naham, Jallam, Allam, Pompom, Tallún*, and *Tálib*.

Rája Radin, one of the sons of the fourth *Menangkábówe* prince, Singang Laut, assumed similar powers to those exercised by the *Eang depertúan múda* of *Rumbówe* in this state, which he still retains, though now opposed by another candidate from *Menangkábówe*.

There are twelve *Súkús* over the twelve tribes in *Srímenánti;* their names with their titles are as follows:

Amin, Baginda Mahárája, Olay, Senára Múda, Molay, Mahárája; Manti, Padúka besár; Lattih, Orang kaia bongsu; Arrih, Sempúrna Mahárája; Lésáh Senára kaia; Aggah, Sri Mahárája; Eytút, Orang kaia kechil; Bandin, Senára Angksa; Si Main, Mahárája Lélah; and *Rejab, Perdana*.

The names of the twelve tribes are, *Sri Lummah Pahang, Sri Lummah Menangkábówe, Battu Ampar, Tannah Dattar, Sa Melóngan, Tiga battu, Payakumba, Muncal, Anak Achi, Battu Balang, Tiga Nenik*, and *Bódoanda Jacoon*.

Srímenánti is the place of residence, burial, and contains the *Astána* of the princes deputed from *Menangkábówe*.

It is bounded on the north by *Jhompóle;* towards the south by *Ulú Múar* and *Rumbówe*, (from which it is separated by the mountains of *Lepat Cajang* and *Gúnong túJoh;)* to the east its boundary with *Johóle* is the hill of *Búkit Pecla;* and to the west the *Paro* stream and *Teráclu* divide it from *Súngie-ujong*. The extent of *Srímenánti* is supposed to be about equal to that of *Rumbówe:* its population is estimated at 8,000. The principal villages are those of *Srímenánti Pinang, Saribú Peela, Póndok Passer*, and *Terách;* the

two latter places now claim their independence. Like *Srímenánti* itself, they were formerly subordinate to *Johóle*, and have been governed for seven generations past by their own *Panghúlús*. The name of the present chief of *Terách* is *Súlong*, and under him are six tribes. The *Panghúlú* of *Póndok passér* is named Ambong: it was with this chief the ex-*Panghúlú* of *Naning* sought and found a shelter after his defeat and expulsion in 1832. Part of *Terách* was formerly subject to *Súngie-ujong*; but during the late internal commotions and struggles for power, by which the *Menangkábówe* dynasty has been rooted out, leaving the interior in a state of anarchy and confusion, the minor chiefs seized on the opportunity to assert their independence, and in this unsettled condition they remain up to the present time.

The manners and customs of the inhabitants of *Srímenánti*, its revenue, internal administration, and law of inheritance, are much the same as those of the natives of the three states already described.

Its produce is tin, sapan wood, wax, ratans, and rice, most of which find their way down to Malacca.

A fresh tin-mine has been lately opened at a place called *Plangaye*, the produce of which during the last three months has been 30 *bhars* of metal.

States of Calang Jellabú, Ulu Pahang, Jellye, and Segámet.

Of the nine interior states, or *Negri sambílan*, formerly tributary to the Malayan dynasties of *Malacca* and *Johóre*, four already noticed, with their dependencies, acknowledged the sway of *Menangkábówe*, or rather of its deputed prince. The remaining five, viz., *Ulu Pahang*, *Calang*, *Jellye*, *Jellabú*, and *Segámet*, with their dependencies, adhered to *Johóre*: this kingdom, however, was too weak to retain them all. *Calang* was wrested from her by a colony of *Búgís*, who established an independent government at *Salangore* towards the beginning of last century, which has rendered itself formidable to its neighbours by the hardy, warlike, and piratical habits of its chiefs, but is now fast declining.

Jellabú has been taken possession of by the descendants of the *Menangkábówe* princes, and is now ruled by an *Eang Depertúan*, named *Rája* Sabu'n, son of *Rája* Adil, the second chief from *Menangkábówe*. This chief is looked upon by the superstitious Malays as a living *Krámet*, from the circumstance of his having "white" or very light blue eyes, with jet black hair.

Jellabú was governed formerly by its *Panghúlú* and *Ampat Súkú*. These still retain considerable authority; the name of the present *Panghúlú* is Aedur Rahman; his title *Akhir Zumán*; the titles of the *Ampat Súkú* are *Dattu Menniang*, *Dattu Mantri*, and *Mahárája Senára*.

The tribes under them are those of *Bodoanda, Tannah Dattar, Muncal,* and *Battu Ballang.*

The forms of government, laws, &c. obtaining in *Jellabú* are much the same as those of the states already described. Its population, which is divided into seven múkims, is estimated at 3750, not including the aborigines.

The produce is gold, ivory, tin, (about 200 picals annually), aloe-wood, jaggery, ratans, &c.; these generally find their way to the *Pahang* market.

The boundary marks of *Jellabú* with *Pahang* are nine Meranti trees, *(Meranti Sambilán,)* growing on the right bank of the *Jellabú* river; with *Sungie Ujong,* a hill called *Bukit Tangoh* and *Dhalu Karu Bandar Barangan;* with *Jompóle,* the hill of *Bukit Dejála;* and with *Calang,* the hill of *Guinting Perhi.*

Ulu Pahang and *Jellye* are now tributary to the *Bandahára* of *Pahang,* a chief nominally feudal to the kings of *Johóre. Jellye* is immediately governed by a *Panghúlú* styled *Mahárája Purba.* It produces a considerable quantity of gold and tin, which go to *Pahang.* Both this state and *Jellabú,* on account of their remoteness from the British frontier, have had little political connexion with the several governments at Malacca.

VI.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 7th September, 1836.

The Honorable Sir Edward Ryan, President, in the chair.

The Proceedings of last meeting were read.

Lieutenant Newbold was proposed as a member by the Secretary, seconded by Dr. Mill.

Lieutenant S. Tickell, proposed by Dr. Pearson, seconded by Mr. Prinsep.

Mr. Vincent Tregear was proposed as an honorary member by Capt. A. Cunningham, seconded by the Secretary:—referred to the Committee of Papers.

Read, letters from Dr. R. Harlan and Professor Lea of Philadelphia, acknowledging their election as honorary members, and presenting various works which will be found under the head of "Library."

Read, a letter from Mr. J. K. Kane, Secretary American Philosophical Society, Philadelphia, acknowledging receipt of Researches, Vol. XVIII. and Index, and Journal, Vol. III.; and presenting publications in return.

Also, letters from M. P. H. Fuss, Secretary of the Imperial Academy of St. Petersburgh; and from Mr. Gabriel Döbrentei, Secretary of the

Hungarian Society at Pest, (in the Hungarian, Latin, and English languages,) noticing the receipt of M. Csöma's Tibetan Dictionary and Grammar.

The following letter from the Honorable G. Turnour was read.

Kandy, July 8, 1836.

Sir,

Various circumstances have concurred to prevent my presenting the Asiatic Society with the accompanying pamphlet sooner. Its completion has been delayed, partly from want of leisure, and also in some degree from my having entered more fully into an account of Páli Buddhistical literature, and published more of the *Maháwanso* in this volume, than I had designed when I addressed you on the 10th July, last year.

In presenting a copy of this publication to the Governor General and the Governors of the several Presidencies, I have mentioned that I had adopted this preparatory course, with the view of eliciting the criticism of oriental Societies and scholars on this portion of the *Maháwanso*, before the principal work issued from the press; and of thereby, at once, obtaining either a confirmation or refutation of the expectations I entertain as to its pointing out the road to a new and interesting field of research in Asia. It would be satisfactory, therefore, to me, if this pamphlet were referred to the Committee of Papers, for its judgment on it. At the risk of being considered affected, I repeat, that it is on the original work and on the general references thence deduced by me, that I court criticism. I cannot attach much importance to a translation, hastily made, of a work composed in a language which I have hitherto studied rather with the view of gathering information regarding the native institutions, than of familiarizing myself with its philological niceties.

The first volume of the *Maháwanso* has been printed. I have only to recast the introduction, and prepare a glossary, to admit of its publication.

If the contributions to your Journal offered in the introduction (p. 110) would be acceptable; as a preliminary step, I would suggest your transferring to its pages, from those of the Ceylon Almanac of 1836, Mr. Armour's translation of Kitetigama's Essay on Buddhism, as well as his prefatory letter. The author of that Essay was a Buddhist priest, of distinguished reputation for learning; and Mr. Armour is unquestionably the best European Singhalese scholar in the Island. The comprehensive form in which the system of Buddhism as recognized in Ceylon is presented in that Essay, and the definitions there afforded of particular terms, will both save details of explanations in my analysis, and serve to render it more intelligible.

I have the honor to be, Sir, &c.

GEORGE TURNOUR.

To the Secretary Bengal Asiatic Society.

Mr. H. T. Prinsep in reference to the above stated, that the Governor General had empowered him also to solicit the opinion of the Society on the character of the Ceylonese Historical Annals, to guide his Lordship in Council as to the extent of patronage to be accorded to the work by the Government of India.

In compliance with the wishes of the Governor General and of the author himself, Mr. Turnour's Introductory Essay, Historical Epitome and translation, were referred to the Committee of Papers to examine and report their opinion of the authenticity and value of the *Páli* annals, which the author has undertaken to introduce to the knowledge of the learned world, as well as upon the fidelity of the translation, confronted, as it is, line by line with the Pali original in Roman character.

The Secretary read the following report from the Committee of Papers on the proposition of Cavelly Venkata Lachmi'a, referred by Government to the Society at the last meeting.

Proposition of CAVELLY VENKATA LACHMI'A, *Pandit, to the Madras Government.*

To His Excellency Lieutenant-General the Right Honorable Sir FREDERICK ADAM, K. C. B., Governor in Council, &c. &c. &c.

Fort St. George.

RIGHT HONORABLE SIR,

Par. 1.—I have the honor to submit respectfully, the accompanying copy of a letter addressed to your Excellency from the Royal Asiatic Society of Great Britain and Ireland, for the consideration of your Excellency in Council, of which Society I am a corresponding Member, whereby it appears that that Society is very desirous to receive every literary information in this part of the world, with a view to complete the late Colonel MACKENZIE's collection. I most submissively solicit, that your Excellency in Council will be pleased to sanction every support from the Government regarding those researches, particularly to authorize me to open a general correspondence with the gentlemen of literary endowments, under this Presidency, in the revenue, judicial and military branches of the service, to enable me to procure every information on the subject of the History, Antiquities, &c. of India.

2.—I beg leave to submit the enclosed copy of an abstract, comprising a brief idea of the nature of the work in which I am engaged. I leave it to your Excellency in Council to judge what may be estimated to be the expense and establishment required to bring it to a completion. It would, however, be presumptive in me, at the present stage of affairs, to suggest any specific amount. But the work consists of twenty-one different ancient alphabets and fourteen languages, ancient and modern, of various parts of the Peninsula; consequently, I would observe, that I will have occasion to employ in every zillah, on the smallest scale, two intelligent scholars, one versed in Sanscrit and the other must be proficient in oriental literature, whose office it will be to collect ancient inscriptions from religious structures and holy temples, which will prove the best guide to ascertain the accuracy of the chronology and history of the country. If the collectors undertake a part of this laborious task, I should imagine that it will prove less expensive: yet I am led to fear greatly, that they can hardly afford to give any attention to it, with the exception of some few of the most literary characters. For the materials thus collected, I would require an establishment of pandits, translators, &c. to arrange and bring down such information that may be collected and approved of.

3.—It never can be expected that the postage of the vast correspondence connected with this arduous task, which are necessarily required by the above Society, can be carried on at my own expense; I therefore most respectfully beg the favor of your Excellency in Council to pass all communications to and from me, as a corresponding member of the Royal Asiatic Society, free of postage, in the same manner as was passed in the late Colonel MACKENZIE's time, relative to which the enclosed is a copy of a letter from the Post Master General of this Presidency, dated 8th March, 1809, for the information of your Excellency in Council, and in the same manner as the Madras Literary Society is still enjoying this privilege without any interruption, as stated to the President of the Madras Hindu Literary Society, in your Chief Secretary's letter under date 22nd February, 1834, which is about *to be discontinued*. But I would faithfully promise that no abuse or advantage shall be taken of the confidence that may be reposed in me on the subject.

I have the honor to be, Right Honorable Sir,

Your Excellency's most obedient humble servant,

(Signed) CAVELLY VENKATA LACHMI'A,

Corresponding Member of the Royal Asiatic Society of Great Britain and Ireland.

(A true Copy),

Madras, 16th June, 1835. *Chief Secretary.*

Report of the Committee of Papers on Cavelly Venkata Lachmi'a's *proposed renewal of Col. Mackenzie's investigations.*

The reference from the Madras Government, for an opinion on the merits of Venkata Lachmi'a pandit's proposition, however complimentary to our Society, might perhaps have been addressed with better effect to the Madras Literary Society, which must be far better acquainted than we can pretend to be, both with the character and attainments of the individual, and with those desiderata in the History of the Peninsula, which he undertakes to elucidate.

We, however, enjoy one advantage in the possession of Mr. now Professor, Wilson's Descriptive Catalogue of Col. Mackenzie's Collection, which, aided by other published works on the history of the Southern Hindu States, may enable us to form a tolerable opinion on the question.

It might be supposed from the entire silence of Venkata on the subject of Mr. Wilson's labours in the statement he has handed up to the Madras Government of the "Progress of the Researches" *in which he is engaged*, that he was a total stranger to the descriptive catalogue; although the brief notice he gives of each state and dynasty, appears based upon the summary contained in the introduction to that work, both as to arrangement and detail; and certainly it adds not one iota to the information made public by Professor Wilson in 1828.

The object of Sir Alexander Johnston, in persuading the Pandit to found a native literary society at Madras was, doubtless, that through the gratuitous aid of those best acquainted with the languages and traditions of the country, and having connections or friends dispersed over the Peninsula, the learned world might be put in possession of translations and digests of the mass of MSS. collected by Col. Mackenzie; at the same time that other materials of a similar nature might be sought out and accumulated*. The Vice-President of the Royal Asiatic Society does not seem to have contemplated the organization of an extensive paid establishment of collectors, pandits and copyists; otherwise it is probable he would have addressed himself to the Government itself, either directly or through the natural channel of the Madras Auxiliary Society. For he would have anticipated that such an extensive scheme would need the control of a master head, accustomed to generalization, and capable of estimating the value and drift of inscription and legendary evidence. The qualifications of Cavelly Venkata for such an office, judging of them by his "abstract," or indeed of any native, could hardly be pronounced equal to such a task, however useful they may prove as auxiliaries in such a train of research. The pandit's *original* and *arithmetical* mode of weighing authorities, of which examples may be found in every item of his statement, is any thing but calculated to contradict this assumption. His remarks on the first, or ancient *Nandavarrum* dynasty of *Andhra*, may be cited as an instance:

"As this is a very obscure dynasty, confidence can only be placed in the inscriptions. From the materials already possessed in the collection of Col. Mackenzie, I suppose *one-eighth* of the history of this dynasty is complete, and *the remainder* should be completed by further research."

The Mackenzie Manuscripts (embracing, as Cavelly Venkata says in his letter to Government, using the words of the late Colonel himself†, no less than *twenty-one* different alphabets and *fourteen* different languages) have been for some time at Madras deposited in the College Library. We have no means of knowing whether during that period the pandit (himself a servant of the college) has published or undertaken the translation or analysis of any part of its contents. In the absence of any such testimony of his competence, contrasted with what will be presently urged, it seems impossible to recommend any large outlay of public money in the way he proposes.

Not that it is undesirable to complete the examination of the Mackenzie papers. On the contrary, all who have read Mr. Wilson's catalogue, will grant that to be an object of high, of national importance; especially when it is asserted that many of the volumes are going rapidly to decay‡, and may not be

* See Mad. Lit. Soc. Journal, No. 12, p. 173.
† See Preface to Wilson's Des. Cat.
‡ See Taylor's Hist. cr. Man.

available a few years hence. The British Indian Government has spent a lakh of rupees in purchasing these ancient records: to refuse the requisite aid for their examination and conversion to public use when they are known to contain a vast store of curious and interesting matter, would be false economy, only equalled by the case of the BUCHANAN MSS. in Calcutta, which cost even a larger sum, and which the Government has recorded its unwillingness to print even free of expense, or to take a single copy of it printed by others*."

But happily, in regard to the MACKENZIE collection, such neglect cannot now be feared. Independent of Mr. WILSON's able summary, we are aware† that Captain HARKNESS, Sec. of the Roy. As. Soc., has undertaken to translate and digest a portion of the manuscripts in London, and M. JACQUET of Paris has intimated that the mass of the Colonel's inscriptions, to which the Hon'ble Court of Directors have handsomely allowed him free access, are to be included in the "*Corpus Inscriptionum Indicarum*," upon which he is now busily engaged; while in Madras itself has lately appeared an able and zealous expositor in the Reverend Mr. W. TAYLOR, whose previous study of, and publication on, the history of the Peninsula, added to his acquaintance with the Tamul and Telinga languages, eminently fit him for the task, and point him out as the properest, if not the only, individual capable of fulfilling the grand object proposed by Sir A. JOHNSTON.

This gentleman has already gone deep into the subject. At a great expence and sacrifice of time, he has published a variety of "*Oriental Historical Manuscripts*" in the original character and in translation, with a connective commentary, shewing their bearing on the general history of the country.

The Editor of the Madras Journal, indeed, announces that Mr. TAYLOR has further undertaken a careful examination of the whole of the College MSS., and that he promises "a paper or series of papers on the subject‡." It would certainly be most desirable that such examination should not be cursory or incomplete, that it should not leave any thing to be done by others, who would have again to travel over the same ground of previous study to be capable of undertaking it. It would, in short, be most expedient to secure the services of Mr. WM. TAYLOR publicly, for the thorough examination of the MACKENZIE records; to allow him such assistance as he might require for the period, (with him necessarily so much shorter than could be allowed to any other,) which he might fix for the task; to unite CAVELLY VENKATA pandit with him, should he be desirous of assistance, (although from an expression at page 63 of his second volume, it may be imagined that he would not count much on the aid of the late Colonel's native establishment,) and to sanction the publication of those records, which he might select as the most valuable, either in elucidation of history or native science, philosophy, religion, customs, &c.

For the collection of new materials, the zeal of the numerous members of the English and native literary societies of Madras, (scattered through the various districts,) will need only the suggestions and direction of a leader so well qualified, to accumulate them, without any necessity for a paid establishment. The circulation of a scientific journal throughout the presidency will materially contribute and doubtless has contributed to excite curiosity to such objects among the "*gentlemen of literary endowments*," whose correspondence either with Mr. TAYLOR or with CAVELLY VENKATA, might advantageously be allowed the indulgence of exemption from postage.

Without first ascertaining Mr. TAYLOR's willingness to accept the office here chalked out, or consulting him on the extent of the aid he would require, it is impossible to estimate the probable outlay; but the Government records will furnish comparative data, in the sums paid for the "oriental translating establishment," entertained for a period under the late Secretary of the Asiatic Society.

* See Mr. Secretary BUSHBY's Correspondence with the Editor of the Gleanings in Science and Journal Asiatic Society.

† See Sir ALEXANDER JOHNSTON's address to the Royal Asiatic Society.

‡ Madras Literary Journal, No. 12, p. 173.

The volumes of Mackenzie papers in our library might advantageously be added to the other documents for the proposed scrutiny*, so that the whole might be published continuously; but these details will naturally come under consideration hereafter, should the Government agree in the view taken by the Asiatic Society, and resolve to entrust the undertaking to the individual pointed out, either directly or through the medium of the Society, (here or at Madras,) which might exercise its judgment as to the final publication, should Mr. Taylor consent to labour under its auspices.

(Signed) J. Prinsep, *Sec.*
For the Committee of Papers.

20*th August*, 1836.

Resolved, That the Society concur in the view taken by the Committee of Papers, particularly as to the expediency of engaging the eminent services of Mr. W. Taylor, for the examination of the Mackenzie MSS., and that the Secretary be empowered respectfully to communicate this opinion, in reply, to the Government.

Mr. Charles Brownlow submitted to the Society the following proposition, relative to a complete copy of the *Alif Leíla*, or Arabic original of the 1001 nights entertainments, lately purchased by him from the estate of Major Macan, well known as the Editor of the *Shah Nameh*.

To James Prinsep, *Esq.*, *Secretary Asiatic Society, &c. &c.*

Sir,

Having become the possessor of the original of the complete Arabian Nights Entertainments, formerly the property of Major Macan, apparently the first that has ever reached India; I am desirous of adding to oriental literature a work which has long been a desideratum with Eastern scholars, by its immediate publication. I trust that my views regarding the importance of this work are not unreasonable; at least I am not alone in my opinion, for no book extant has ever enjoyed such universal popularity as this, even in its translated form. Much of its narrative depicts, with miraculous fidelity, that most difficult class of incidents to describe with interest—the incidents of common life; and, beneath even its most grotesque and impossible circumstances, there is a moral beauty—a knowledge of humanity discoverable, which comes home to all, and *throughout*, a vivid power of description, which is unequalled in any other production, and addresses itself to the mind with an effect almost pictorial. It is the remark of an orientalist of high repute, speaking of this unique and extraordinary work, that "we here behold a genuine portrait of the spirit and character, the common life and domestic manners, of a once powerful nation, which excelled in arts as well as in arms, in three quarters of the globe; in these tales we see the Arabs, depicted by themselves, in the tents of the desert, and in the courts of the Caliphs. We mingle among their merchants, join them in their travelling caravans, visit them in their social circles, and even penetrate into their harems."

If the book appeal thus powerfully to the European reader, whose sympathies are weakened by distance and difference of habit, how much more emphatically must it address itself to the inhabitants of the East, in the overflowing and beautiful language in which it was originally written!

My chief object in this paper is to draw public attention to the document, and to give such evidence regarding its authenticity as I have been able to collect, under the very difficult and embarrassing condition of having no other complete copy to refer to. My attention has been directed, in the first instance, to the MS. alone, which contains the unbroken series of one thousand and one nights; next, to its quality, which is reported on by competent persons to be clear, and remarkably free from literal errors.

* See printed catalogue of the Library Asiatic Society.

My next step was to examine the MS. with the printed edition of the "Two Hundred Nights," published some years since in Calcutta, whence it appears that the latter is a set of excerpts merely, made, in many instances, without regard to the literary value of the selection, and in some, overlooking even the integrity of the tales. These fragments have been arbitrarily renumbered as the "*first* two hundred nights."

I have been fortunate enough to obtain a copy of that edition of the original now in the course of publication at Breslau, by Professor HABICHT, an orientalist of high attainments; he has devoted his life (and it had need be a long one to enable him to fulfil his task), to the publication of a complete edition of this work; he has procured copies of the MS., perfect and imperfect, from Tunis, from Cairo, and from the library of the Baron SILVESTRE DE SACY, and is proceeding with the publication, subject to the critical collation of these MSS. I find, on comparing the MS. in my hands, with the edition of HABICHT, as far as published, i. e. to upwards of three hundred and fifty nights, that no important discrepancies occur, though, in transcripts of this length, there will always be found considerable differences. This fact is curiously illustrated by the German Professor, who has carefully set forth the variations, omissions, redundancies, and inversions of order, found on comparison of his various MSS. It is likewise stated by M. TREBUTIEN, in his preface to a recent French translation of this work, (published in 1829,) that he collated twelve manuscripts, and among them those of the King's Library at Paris, and the Bodleian copy, which presented continual discrepancies, both as to style and the order of the tales, which every copyist had arranged according to his own taste. These differences, though they would be important in a historical paper, are of little consequence in a series of fictions. They have manifestly resulted from the carelessness or caprice of the transcriber, and do not affect the value of the work. All that can be done, under these circumstances, is to adopt the reading most consistent with the context.

Beyond the print to which HABICHT's edition extends, there exist *here* no means of continuous comparison. The evidence of genuineness is strengthened, however, by finding, that the portion of the original already known in the Calcutta edition, is found in the manuscript in my possession, except that the stories, in the latter, stand in their natural and proper connexion with the remainder of the text. The tales generally correspond in their order with those found in SCOTT's translation of 1801, taking into account those contained in the supplementary volume, (translated from WORTLEY MONTAGUE's MS.) and allowing for the omission of those which the translator has deemed it best, from motives which he assigns, to pass over.

A remark made by the Baron PURGSTALL (VON HAMMER) on the subject of GALLAND's translation, is another strong proof of the authenticity of the manuscript before me. He says, "the MS. used by GALLAND* was far from complete; and if he published no more stories, it was not because the remainder were less deserving of translation, but because he had no more in his possession. The imperfection of his manuscript compelled him also to invent, as he has done, a conclusion to that story of the Sultan of the Indies:—we shall find that SHEHERZADI was saved from death, neither by her many amiable qualities, nor by her inexhaustible tales, but by her having, during the 'thousand and one nights,' borne the Sultan three children!" TREBUTIEN's translation, the result of the collation of twelve of the best manuscripts in Europe, confirms this; it is a *literal* translation of the one now under consideration; the passage occurs at the thousand and first night, and is unquestionably one of the most pathetic and beautiful in the whole work! To the above may be added the strong *internal* evidence deducible from the uniform character of the style throughout. The manuscript is open for general examination, and I shall gratefully appreciate the opinion and advice of competent orientalists.

With reference to my intention of publishing, we have great advantages in the mechanical facilities, which we can so readily command, in printing oriental

* TREBUTIEN has since examined the MS. used by GALLAND, and finds that he possessed only two hundred and eighty-four nights.

works in this country ; and a work of this kind, which would take many years in Europe, might be readily produced here in less than twelve months. We have our disadvantages too : for it is far from probable, that any editor could be procured *here*, possessing the high qualifications and the indefatigable industry of the Professor before named, united with the leisure necessary for the undertaking ; one who would carry through the formidable labour of collation, of elaborate verbal criticism, and the compilation of a lexicon of words found in the original Arabic of this work, but in no other authority extant! We may despair of this ; but it is not too much to say, that an edition, accurate in all essential particulars, may be brought through ; and I will not conceal, that it would be a source of great gratification to me to be the means of giving to the classical literature of the East a book, which, while it has enjoyed throughout Asia and the civilized world a reputation equalled by none, has been, heretofore, in its complete and original form, but a *name !*

Calcutta, September 5, 1836. C. Brownlow.

Resolved unanimously, That Mr. Brownlow is entitled to the warmest thanks of the Society, and of all interested in oriental literature, for his disinterested exertions in regard to the *Alif Leíla*, and for his laudable wish to make public the valuable and complete edition he has become possessed of. As it seems possible, by further comparison of the manuscript with the recent translation of M. Trebutien, and with the Arabic printed version of Professor Habicht, and the incomplete volumes published in Calcutta, to add in some degree to the guarantee of its authenticity, the Committee of Papers is requested to enter upon this examination, and report upon the extent of patronage to be accorded by the Society to Mr. Brownlow's laudable enterprize.

A letter from M. Eugene Ormoult, Director of the French Journal entitled "*Institut,*" addressed to the President, invited the Society to communicate copies of its proceedings and publications to this Journal, and to subscribe for a copy of the work. Referred to the Committee of Papers.

A letter was read from Dr. F. Mohl, one of the Secretaries of the Asiatic Society of Paris :—

Referring to a prior official communication (not yet received) offering to unite with the Bengal Society in the expence of completing the oriental publications abandoned by the late Government of India, and in furtherance thereof requesting a supply of the works already finished for sale on the Society's account, it states that the five copies of the Mahabhárat sent home under charge of our associate M. Richy, had been sold in one day, and it was calculated that there might be a demand for 100 copies of this work on the continent, and for half that number of other Sanscrit works. The money realized has been paid to the Society's agent in London. Dr. Mohl concludes :—

"Nous ferons ici tout ce que nous pourrons pour repandre ces ouvrages en France et en Allemagne, car nous sentons tous vivement le service que la Société de Calcutta rend à la litérature orientale ; et s' il m'est permis de parler de moi je ne desire rien plus ardemment que de pouvoir lui etre utile dans cette circonstance, ou elle a pris si energiquement et si honorablement les interets de la litérature orientale."

Library.

The following books were presented.

Transactions of the American Phil. Society—*by the Society, through Mr. Ryan.*

The American Almanack for 1836—*by ditto.*

Harlan's Medical and Physical Researches—*by the Author.*

Transactions of the Geological Society of Pennsylvania, vol. i.—*by the Society.*

Transactions of the Hungarian Society of Pest—*by the Society.*

Transactions of the London Society of Arts, vol. i. pt. 2—*by the Society.*

Marsden's Numismata Orientalia, 2 pts. in 1 vol. 4to—*by the Author.*

Notes on the Indica of Ctesias—*by Professor Wilson, the Author.*

Epitome of the History of Ceylon and Translation of the Mahâwanso—*by the Hon'ble G. Turnour, the author.*

Second Report on the State of Education in Bengal—*by Mr. W. Adam.*

Bell's Comparative View of the External Commerce of Bengal, during the years 1834, 35, and 36—*by the Author.*

The India Journal of Medical Science and Scientific Review—*by Dr. F. Corbyn, Editor.*

The Meteorological Register for July 1836—*by the Surveyor General.*

The following book from the Booksellers.

Lardner's Cabinet Cyclopedia—*Stebbing's Reformation,* vol. i.

Museum of Antiquities, &c.

Read, a letter from J. Bell, Esq, presenting various articles of food and clothing, in use among the savage tribes inhabiting the coasts of Dampier's Straits, brought to Calcutta by the Ship Bombay Castle.

The Secretary presented in the name of Lieut. Colin Mackenzie, various weapons taken from the Malay pirates;—among others a long bambu tube, through which light poisoned darts are blown by the mouth. The slightest wound inflicted by them is esteemed fatal. Lieut. Mackenzie also presented the head of a pirate chief killed in the late expedition.

The Secretary called to the attention of the members present, a very curious piece of sculpture, sent down for the express inspection of his associates by Colonel Stacy, a Member of the Society.

This sculpture (of 2-3rds size)—cut in the spotted red sandstone of Agra and Mathura. It seems to represent Silenus or Bacchus, his brows crowned with vine leaves, and supported by bacchanal attendants. The dresses of the figures, of which there are several on both sides very well proportioned and grouped, is decidedly not Hindu but rather Grecian, having a tunic of plaited folds gathered round the waist by a band. The figures and foliage support a large circular bason, which may have been for holding sacred water, or connected with a fountain. We must endeavour to make a drawing of this very interesting groupe, and publish it, with the zealous proprietor's account of its discovery.

Literary Communications.

A memoir by the Hon'ble G. Turnour on the authenticity of the early Buddhistical Chronology, developed in the *Páli* annals, as compared with the *Rája Tarangini* and other authorities, was submitted.

[This will be printed in an early number.]

A note on the *Muar* State, being the conclusion of his series of essays on the native divisions of the Malay Peninsula, and an outline of their

several political and commercial relations, was received from Lieut. T. J. Newbold, A. D. C. to Brig. Gen. Wilson, C. B.

Extract of a letter from Mr. V. Tregear was read, offering should the Society wish it, to forward to Calcutta the *Bhitarí láth*, containing the important inscription which the Vice-President Dr. Mill is now engaged in decyphering, as it is held in no reverence or consideration by the people of the neighbourhood.

Some conversation took place on Mr. Tregear's proposition, which his letter explained would not have been made, if it involved the removal or destruction of an object of local interest or veneration. The pillar was at present isolated, half buried in the ground, and in no way regarded by the people. By transferring it to the museum it would be preserved from further injury, and an inscription of great historical importance would be rendered permanently accessible to the antiquarian. It was the concurrent opinion of the members present, that if the removal could be effected at a moderate cost, Mr. Tregear's obliging offer should be accepted.

Adverting to the neglected condition of the pillar lying half buried in the ground in the fort at Allahabad, and the great interest which the inscriptions it contains had excited among orientalists in Europe, it was

Moved by Sir J. P. Grant, seconded by Dr. Corbyn, that a respectful representation should be made to the Government of India, on the expediency of taking measures to preserve the ancient monument at Allahabad from further decay, by setting it up, with a pedestal and railing, in such position within the fort or elsewhere as may appear most appropriate.

Physical Department.

A letter was read from the Secretary to the Medical and Physical Society of Bombay, forwarding a memoir by Dr. Lush, on the Fossils recently discovered in the Gulf of Cambay.

The fossils have been sent to Calcutta by the Chief Secretary Mr. Wathen, and may be daily expected, when the paper will be printed.

Mr. J. Trotter presented some specimens of the fossil bones recently discovered at the Cape of Good Hope.

Mr. Trotter's note informs the Society, that Mr. Pope, the modest discoverer of this new fossil deposit, had kindly promised to collect a more numerous series for the Society's museum, to be presented in the name of his lady, and that they may be soon expected. The specimens now presented consist of vertebræ and fragments of ribs of some large animal, which from their mutilated state cannot be identified; they are thoroughly fossilized and very hard. Mr. Pope says they are found chiefly in the bed of the Ganka river, whither they have been washed from the site of their inhumation in a "sandy and slate stone" soil: one specimen in his possession was found imbedded in this hard slaty matrix, from which it required a crowbar to extract it; it was as one solid rock. The vicinity of the district called the "Gouph" abounds with specimens; the country is stony and barren, and much intersected with dry ravines. It is situated between the *Zwarteberg* and the *Nieuwbergen*, the central part of the Cape Colony, Lat. 33° S. and 22°, 23° W. Long.

A memoir on the fossil remains of the smaller Carnivora of the Sub-Himálayas, by Lieutenants W. E. Baker and H. M. Durand, Engineers, with a lithograph, was submitted.

Description of some new species of the Strigine family; and indication of a new genus of the Picidæ, by Mr. B. H. Hodgson.

A specimen of the sea-horse (*Hippocampus*) called by the *Mag* inhabitants of Ramrí a young *Ngaga*, or "volcano serpent," was presented by Captain D. Williams, Senior Assistant Commissioner in Arracan.

Dr. McClelland exhibited to the Society the collections made by him, of Zoology and Geology, in the late expedition to the Tea province of Asám, and submitted two written notices, one of which he read in elucidation of the geology of the Kasia range.

Dr. McClelland stated, that the fossil shells were found in such numbers and variety at *Chirra Punji*, as to afford the most unquestionable evidence of the tertiary nature of the Kásia mountains: and further, that when the species shall be rigidly identified and compared with those of the London and Paris basins and the sub-Appenine beds, as well as with existing species in the Indian seas, it may be possible to find their place in the *Eocene* and *Pliocene* divisions of Lyell.

This he considered the first instance of any extensive deposit of fossil shells having been found in sub-Himalayan beds, calculated to throw sufficient light upon the period of upheavement.

Mr. Cracroft, and long before him Mr. Scott, had indeed made known the cerithia and turrilites of Chirra, and a variety of the nummulites of the Sylhet limestone, which is in fact made up of shells and nothing else; but to Dr. McClelland belongs the honor of having found 27 varieties of shells in the same limestone; also, of having found an extensive deposit of marine shells on the S. W. face of the mountains quite distinct from any limestone whatever, but imbedded in a superficial layer of partially consolidated sandy matter, which reposes on the surface of sandstone covered only by the soil, and of having exhibited 100 species nearly of these shells for the first time to the Society.

The great extent of the collection and the variety of objects of natural history particularly—embracing 120 fishes of the Brahmaputra; besides birds, quadrupeds, insects, shells, and a very numerous and regular series of rock specimens taken from the whole line of journey,—did great credit to the industry of Dr. McClelland. A vote of thanks was unanimously passed to him for the opportunity he had so kindly afforded the Society of inspecting his portion of the fruits of the late expedition to Asám. The descriptive catalogues of the whole are now in a state of forwardness, and will, it is presumed, be incorporated in a general report to Government by Dr. Wallich, who conducted the expedition, and it is hoped be eventually published for general information, either in a separate volume, or through the medium of the Society's Researches.

[We shall hasten to insert the two notes as soon as space permits.]

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of August, 1836.

Day of the Month.	Observations at 10 A. M.							Calculated Humidity.			Observations at 4 P. M.							Calculated Humidity.			Register Thermometer Extremes.		Rain.	Wind.		Weather.	
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew point.	Hair Hygrometer.	Centesimal tens. of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	New Standard Barometer.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew-point.	Hair Hygrometer.	Centesimal tension of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	Cold on roof	Heat in sun.		10 A. M.	4 P. M.	Morning.	Evening.
1	29,543	29,580	83,1	3,9	3,3	76,2		82	80		29,439	29,503	85,6	5,2	4,3	76,6		75	73		74,5	95,8	,10	SW.	S. E.	cum. strat.	hazy.
2	,624	,62[illegible]	85,1	5,8	5,0	75,5		78	73		,532	,603	87,1	5,5	4,6	76,0		75	70		75,0	96,5	,05	SW.	se.	do	cum. str.
3	,633	,696	86,5	6,1	5,4	76,3		75	80		,514	,598	88,9	8,7	8,6	74,7		63	62		75,0	98,2		s.	se.	do. fine.	hazy.
4	,587	,630	86,7	8,6	7,8	74,5		60	68		,484	,548	85,3	4,6	4,3	76,5		80	76		76,2	103,2	,35	S.	se.	fair.	threatening.
5	,545	,599	86,3	5,2	5,0	77,7		75	75		,407	,480	90,9	8,3	7,6	76,5		65	64		76,0	116,0		se.	ese.	cum. strat.	cir. cum.
6	,449	,512	83,2	6,2	5,6	77,0		72	70		,327	,399	87,4	5,7	4,7	78,7		75	76		78,2	103,8	,05	se.	se.	do	showery.
7	,382	,435	86,7	5,4	5,4	76,5		75	72		,274	,325	87,0	4,9	4,0	77,5		77	74		77,0	105,0	,35	S. E.	e.	cum.	rain.
8	,351	,393	86,4	4,6	4,2	77,5		80	75		,241	,286	87,1	4,3	4,0	79,6		80	78		75,2	97,8	,35	S. E.	E.	cldy.	showery.
9	,363	,410	86,9	4,5	4,4	77,4		80	74		,310	,362	86,2	4,6	3,6	76,6		80	74		77,8	91,0	,30	ES. E.	ese.	hazy.	overcast.
10	,522	,563	85,9	4,1	3,5	75,0		82	72		,448	,496	86,9	4,2	3,0	76,5		80	73		76,2	91,0	,25	ES. E.	S. E.	showery.	rain.
11	,540	,582	85,7	4,5	4,3	76,7		80	76		,445	,499	88,7	6,1	4,6	77,0		72	69		76,2	97,5	,10	se.	se.	cum. fine.	do
12	,571	,614	86,8	5,1	4,7	76,6		80	73		,455	,514	90,9	8,4	6,8	79,0		65	69		76,2	85,9		se.	se.	do	cum.
13	,609	,643	85,1	4,6	4,8			78			,494	,542	85,5	4,2	4,0	77,3		80	77		77,0	95,4	,20	E.	E.	do	showery.
14	,566	,620	85,8	5,0	3,5	78,0		85	78		,461	,523	87,3	4,8	4,8	78,6		78	76		76,7	97,9	,65	se.	se.	do	do
15	,523	,582	86,6	6,1	5,2	75,8		75	71		,396	,464	87,5	5,8	5,1	76,5		72	70		76,8	112,5		se.	se.	do	do
16	,484	,544	87,5	4,8	4,6	77,0		80	72		,480	,452	87,9	5,4	4,0	77,3		75	72		78,2	100,5		se.	e.	do	do
17	,561	,622	87,3	5,2	5,3	75,0		75	68		,478	,542	87,5	4,9	4,4	78,3		77	74		78,2	99,1	1,50	se.	se.	hazy.	overcast.
18	,541	,596	86,3	4,6	3,8			82			,446	,512	88,7	6,6	5,2	75,6		70	66		74,7	101,0		ne.	ne.	cumuli.	showery.
19	,489	,547	85,3	3,9	3,7	77,2		82	77		,363	,432	88,5	4,9	4,0	77,6		80	71		77,2	110,0	,55	ne.	ne.	do	do
20	,440	,490	86,4	5,2	4,7	77,5	90	80	76	78	,298	,380	91,2	8,8	7,2	77,3	85	62	65	68	76,2	100,0		e.	o.	do	do
21	,329	,338	84,5	3,0	3,0	80,0	95	85	87	88	,227	,280	84,2	3,5	3,8		94	80		87	76,4	85,0	1,25	ne.	S.	rain.	rain.
22	,411	,453	83,5	3,5	2,5	77,8	95	87	84	88	,353	,415	86,5	4,7	4,0	78,0	92	80	77	82	76,2	93,5	,30	se.	se.	overcast.	showery.
23	,529	,536	85,9	4,0	3,7	77,5	93	82	77	84	,435	,495	85,6	4,2	4,0	77,5	94	80	77	87	75,0	99,3	,20	S. E.	se.	fine.	do
24	,544	,604	86,9	5,0	4,2	77,8	91	80	75	80	,394	,460	85,3	5,0	4,2	78,0	90	77	80	78	76,0	103,6		S. E.	se.	showery.	do
25	,389	,453	84,7	4,4	4,0	77,0	92	80	81	82	,285	,358	86,5	5,1	4,8	76,6	92	77	74	82	75,3	84,2	,35	S. E.	S.	cloudy.	do
26	,527	,568	81,2	2,9	3,2	76,2	94	85	85	87											73,0	85,0	4,00	se.	—	hd. rain.	do
27	,690	,743	84,1	3,5	3,4	76,7	94	85	79	87	,571	,639	83,7	7,1	6,0	75,5	87	67	66	72	74,5	95,5	,10	S. W.	S. W.	overcast.	fine.
28	,641	,678	85,8	4,0	4,0	79,0	91	82	78	80	,522	,535	89,7	9,7	8,5	73,5	82	57	60	63	78,2	104,0		S. W.	S. W.	fine.	do
29	,558	,614	86,3		5,0	76,5	89	77	74	76	,447	,503	89,4	4,5	4,7	78,2	90	80	71	78	77,8	111,2		S. W.	S. E.	cum. str.	showery.
30	,531	,586	85,9	4,9	4,1	76,4	91	80	74	80	,437	,499	87,1	4,1	4,2	77,3	92	82	74	82	77,4	111,6		S.	S. E.	do	do
31	,555	,611	86,5	4,5	4,7	77,3	91	80	75	80	,452	,513	86,1	4,8	4,3	77,7	92	77	77	82	75,8	101,2	,35	S. E.	S. E.	hazy.	do
Mean,	29,517	29,549	85,8	4,7	4,4	76,9	92	79	76		29,414	29,472	87,5	5,6	4,9	77,1	90	74	72		76,3		11,35	lightsoutherly		sultry weather.	

The remarks of last month apply to the barometers. The differences have been .032 and .048 at 10 A. M. and 4 P. M. respectively, agreeing with former observation. The *Wet-Barometer* column has been omitted this month to make room for a daily comparison (which will be continued) of the three methods of finding the percentage of humidity in the air. The first column is taken from the table for the wet-bulb instrument inserted in the July number: the second column is calculated from Dalton's table of aqueous tension;—dividing the tension at the dew point by the tension at the temperature of the air: the third is taken from my table for the hygrometer published in the Royal Institution Journal and in the Oriental Magazine for June 1827. It should be noted that (where not observed by myself) there is a tendency to estimate the dew-point a little below the truth, which makes the calculated dryness too great.—J. P.

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I.—*Examination of some points of Buddhist Chronology. By the Hon.* George Turnour, *Ceylon Civil Service.*

While the question of the authenticity of Buddhistical chronology, developed in Pali annals, subsequent to the advent of Sa'kya Sinha, is under the consideration of the Committee of Papers of the Asiatic Society, I beg to offer a few observations on the Chronological Table appended to Professor Wilson's Essay on the Hindu History of Cashmir, called the *Rája Taranginí*, published in the XVth volume of the *Asiatic Researches*.

The first portion of this history, compiled by Kalha'na Pandit commences with the fabulous ages; it is represented to extend to A. D. 1024; and the author is reputed to have flourished about Saka 1070, or A. D. 1148.

Before tabularizing and adjusting the chronology comprised in that history*, Professor Wilson gives the following details regarding the reign of the monarch Aso'ka.

"The last of these princes *(Sachinara)* being childless, the crown of *Cashmir* reverted to the family of its former rulers, and devolved on Asóka, who was descended from the paternal great uncle of *Khagendra*. This prince, it is said in the *Ayen Acberi*, abolished the Brahminical rites, and substituted those of *Jina*; from the original however it appears, that he by no means attempted the former of these heinous acts, and that, on the contrary, he was a pious worshipper of *Siva*, an ancient temple of whom in the character of *Vijayésa* he repaired. With respect to the second charge, there is better foundation for it, although it appears that the prince did not introduce, but invented or originated the *Jina Sásana*. He is said to have founded a city called *Srínagar*, a different place,

* Want of space must excuse our inserting these tables, which will be accessible to all our readers in our Chronological and Genealogical Appendix.—Ed.

however, from the present capital, which is attributed to a much later monarch. In the reign of ASÓKA, *Cashmir* was overrun by the *Mlech'has*, for whose expulsion the king obtained from *Siva* a pious and valiant son, as a reward for the austerities he had practised *."

"JA'LOKA, the son and successor of ASÓKA, was a prince of great prowess: he overcame the assertors of the *Bauddha* heresies, and quickly expelled the *Mlech'has* from the country, thence named *Ujjhita dimba*: he then carried his victorious arms to foreign regions, and amongst others to the north of Persia, which he subjugated in the reign of DARAB, and then proceeding in an opposite direction, he subdued the country of *Canouj*."

"The successor of this celebrated monarch was DAMODARA, of whose descent various opinions were entertained."

"DAMODARA was succeeded by three princes who divided the country, and severally founded capital cities named after themselves. These princes were called HUSHKA, JUSHKA, and CANISHKA, and these appellations are strongly corroborative of an assertion of our author, that they were of Turushka, that is, of *Turk* or *Tartar* extraction: they are considered as synchronous, but may possibly be all that are preserved of some series of Tartar princes, who, it is very likely, at various periods, established themselves at *Cashmir*. The chief event recorded of their reign is the foundation of the three several capitals, named after themselves, *but another and more important consequence of their sovereignty is said to have been the almost entire change of the national faith, and the nearly exclusive prevalence of the doctrines of the Bauddhas under a Bodhisatwa or heirarch named* NA'GA'RJUNA. *The period at which this took place is said to have been* 150 *years before the death of* SA'KYA SINHA."

"The *Tartar* princes were succeeded by ABHIMANYA, a monarch evidently of a Hindu appellation, and a follower of the orthodox faith, which he re-established in *Cashmir*."

In elucidation of the date assigned to the age in which NA'GA'RJUNA lived, Professor WILSON adds the following appendix. The Sanscrit quotation, which (if I have correctly read it) is here represented in Roman, is there given in Déva-nágari characters.

* The faith of ASÓKA is a matter of very little moment, as the prince himself is possibly an ideal personage: as, however, the comparative antiquity of the Buddha and Brahminical creeds in *Cashmir* has been supposed to be affected by it, and the events subsequently recorded, it may be advisable to give the passages of the original, which shew that ASÓKA was a worshipper of SIVA: it is not impossible, however, if we are to attach credit to any part of this portion of theCashmirian history, that he permitted heretical, possibly *Bauddha* doctrines, to be introduced into the kingdom during his reign from his Tartar neighbours.

"Then the prince ASÓKA, the lover of the truth, obtained the earth; who sinning in subdued affections, produced the *Jena Sásana*." This may mean possibly something very different from the received idea, and may imply his neglect of affairs of state through excess of devotion, and his consequently omitting to prevent the intrusion of a foreign power, rather than a foreign faith, into the kingdom, the expulsion of which was the object of his son's birth.—[Note by Professor WILSON.]

" Appendix No. 7, to Professor WILSON's Essay.

" The passage in the text adverted to (page 23) requires a little consideration, both as to its meaning and the chronological views to which it has already given rise. The text of the original runs thus :—

Té Turushkánwayódbhútá pi puṇyásrayá nripáh Sushkakshétrádi déséshu maṭhachĭtyádi chakriré. Prájyé rájyakshané teshán, práya Kasmíramardala*m* bhójyamasté sawauddhán*am* pravrajyorjíta téjasa*m*. Tató Bhagawatah SA'KYA SINHASYA puranirvrité asmin saha lókdhatau *sárdham varshasatam* hyagát Bódhisatwascha désésmin néka bhuméswaró bhut, sacha NA'GA'RJUNAH srímán shaḍarhatwa na sanṣrayé.

" There are in this passage some obvious inaccuracies, and some compounds of a purport absolutely unknown to the most learned Brahmans. Taking it as it stood, it appeared to involve the position that the *Turushka* princes *preceded* SA'KYA SINHA by above a century and a half; and concluding the GAUTAMA of the sixth century before the Christian era to be intended by the name SA'KYA SINHA, which is always enumerated as a synonime, the date of GONERDA III. was adjusted accordingly in the preceding pages, and placed 640 B. C. An opportunity having subsequently occurred of consulting a Burma priest, and a man of some learning, on the subject, there appeared good grounds for revising the passage, and altering the results, in consequence of which several pages previously printed off have been cancelled, and it is only in the marginal dates of the first dynasty that any traces of the error have been suffered to remain. These are of comparative unimportance, and will be readily rectified by adverting to the table. We have now then to offer a translation of the passage; premising, that the term *Puranirvrité* should be *Parinirvrité*, the sixth case of *Parinirvriti*, or in PALI, *Parinibbuti*, the ordinary term used by the Bauddhas, to express the final *Nirvritté* or emancipation of their Buddhas or saints in its fullest sense; *Pari* being added as an intensitive prefix. The use of this and some other peculiar expressions, which are at present quite unintelligible to the ablest scholars among the brahmans of Hindustan, but are familiar to the Rahans of the Burman empire, proves that KALHA'NA, the author of the Cashmirian History, or at least his guides, were well acquainted with the language, and, probably, with the system, of the Bauddhas.

' They (Hushka, &c.) of *Turushka* descent, were princes, asylums of virtue, and they founded colleges, and planted sacred trees, in *Sushka* and other places. During the period of their reign the whole of Cashmir was the enjoyment of Bauddhas, eminent for austerity. After them, when 150 years had elapsed from the emancipation of the Lord SA'KYA SINHA in this essence of the world, a *Bódhisatwa* in the country named NA'GA'RJUNA, was *Bhumiswara*, (Lord of the earth,) and he was the asylum of the six A'rhatwas.'

" As the prevalence of the *Bauddhas* and consequence of NA'GA'RJUNA, if not subverted, were at least checked in the ensuing reign of ABHIMANYA ; and as the passage expressly states that the circumstance occurred after the *Turushka* princes, the 150 years subsequent to SA'KYA SINHA must fall within the limits of ABHIMANYA's reign : it is therefore necessary only to fix the date of SA'KYA SINHA to determine that of the several reigns occurring in this portion of our history.

Assuming that this SÁKYA SINHA was the BUDDHA of 542 B. C. he ventures to correct thereby KALHÁNA's more distant epoch :—

"At the same time KALHA'NA, well informed as he is in these respects, has evidently confounded the two periods, and hence assigned to SA'KYA SINHA a date corresponding to at least 1332 B. C. although apparently designating the person who flourished B. C. 542. *We may therefore venture to correct his chronology with reference to this latter date;* although until we can be satisfied that the SA'KYA SINHA of the North-west was one individual with the GAUTAMA of *Magadhá*, we cannot venture to attach any thing like certainty to this emendation. Some circumstances in favor of the date laid down are adverted to in the concluding observations; and we may here add, that there seems to be a strange connexion between the circumstances and dates of the *Zerdashts* of Persia and the *Buddhas* of India, which deserves a more particular investigation than we have hitherto had materials to undertake.

"*The passage relating to the prevalence of the Bauddha faith in Cashmir includes the mention of an individual,* WHOSE HISTORY IS FULLY AS OBSCURE, IF NOT AS IMPORTANT, AS THAT OF BUDDHA.

"NA'GA'RJUNA as a *Bodhisatwa*, (see note in page 21,) may be either a religious or a secular character: he was probably the former, as a hierarch, the prototype of the modern Lama of *Tibet;* his other title, however, *Bhumíswara** may mean a prince, and has probably induced Mr. COLEBROOKE to translate the text generally thus:—

"DA'MODARA was succeeded by three kings of the race of *Turushka*, and they were followed by a *Bodhisatwa*, who wrested the empire from them by the aid of SA'KYA SINHA, and introduced the religion of *Buddha* into *Cashmir*. He reigned a hundred years, and was followed by *Abhimanya*."

After carefully considering all the data accessible to him, Professor WILSON decides on adopting the above Buddhistical record of the age in which these three *Turushka* princes and NÁGÁRJUNA flourished, as the most authentic authority available for making the first adjustment in his chronological table; whereby he reduces, at the termination of his "first period," the date of GONERDA III.'s reign from B. C. 1182 to B. C. 388, showing an anachronism in the *Rája Tarangini* of 794 years.

This circumstance alone, even if no new light could be thrown on this interesting question, would afford a powerful argument in support of the opinions I entertain of the superior accuracy and authenticity of Buddhistical over Brahminical chronology. We should bear in mind, too, that the *Rája Tarangini* is admitted to be "the only Sanscrit composition yet discovered to which the title of history can

* "*Iswara*," (Páli "*Issaró*,") and "*Sámikó*," are often conferred on Buddhistical sacerdotal characters who have gained great ascendancy. Vide chap. v. of the *Maháwanso*. "*Addháyan sámanéró mé gharé hessati* SA'MIKÓ." Chap. xiv. "*Gahetá pathawi míhi: Dípé, hessanti* ISSARA'." "This samanéro will this very day become the master of my palace." "The land will be usurped by these persons: they will become the lords of this island." (Note by Mr. T.)

with any propriety be applied." It is not a little remarkable, therefore, that Professor WILSON, after having thus recognized the correctness of the date assigned to SÁKYA SINHA's death, and availed himself of an event connected with Buddhistical history to correct the chronology of the *Rája Tarangini*, should have entirely lost sight of these circumstances, and been led, in analyzing the *Tibetan* works, to say that "any thing like chronology is, if possible, more unknown in Buddhistical than Brahminical writings, and it is in vain to expect any satisfactory specification of the date at which BUDDHA SÁKYA flourished."

The object, however, which I have more immediately in view at present, is to point out, that the correction adopted by Professor WILSON in this table, which reduces the date of the reign of GONERDA III. from B. C. 1182 to B. C. 388, invites criticism and reconsideration, as being apparently inconsistent with the most approved data previously established, in both the Brahminical and Buddhistical chronologies; and also to endeavour to prove that the imperfection of the adjustment proceeds from the omission of a *single letter* in the passage of the *Sanscrit* text quoted in his appendix. Whether the omission of this single letter has arisen from KALHÁNA Pandit having misunderstood the Buddhistical authority, from which his information was derived; or from the inaccuracy of some transcriber of his work, will not, perhaps, ever be ascertained; unless, indeed, some copy of this history be hereafter found, exempt from this minute inaccuracy, the discovery of which would fix the erratum on the transcriber.

Before I explain the grounds on which I justify the addition of "*d*" to the numeral "*Sárdhán warsha sataň*," it will be proper to notice, why the adjustment, made according to the present reading of that numeral, is inconsistent with "the present most approved data of both the Brahminical and Buddhistical chronologies."

According to the Brahminical chronology developed in the *Puránas*, as analyzed by Sir W. JONES, Colonel WILFORD, and other oriental scholars, the date assigned to the reign of CHANDRAGUPTA is B. C. 1502; and whether we regard him as the contemporary of ALEXANDER the Great, or of SELEUCUS NICATOR, the Brahminical date assigned to his reign will have to be reduced to about B. C. 325; making an adjustment of about 1177 years; in comparison with which the foregoing adjustment of 794 years at the reign of GONERDA III. is deficient to the extent of 383 years, and to that extent, therefore, it is at variance with the present cardinal point of Brahminical chronology, the age of CHANDRAGUPTA. On a careful comparison

of Professor WILSON's Table with Sir W. JONES's Essay, it will, I think, be admitted that KALHÁNA Pundit did not depart materially from the fictitious scheme of Hindu chronology contained in the *Puránas*, until after the reign of GONERDA III.; and that it was subsequent to that date, that he attempted to correct progressively the Hindu anachronism. According to the *Puránas*, CHANDRAGUPTA succeeded to the *Magadha* empire about B. C. 1502. Admitting (for reasons hereafter explained), that ASÓKA of *Cashmir* is identical with ASÓKA of *Magadha*, the grandson of CHANDRAGUPTA, we shall then have a series of nine (three of *Magadha* and six of *Cashmir)* princes to fill up the term of 320 years intervening between CHANDRAGUPTA B. C. 1502, and GONERDA III. B. C. 1182, giving a somewhat high average, certainly, of 35 years and seven months, but still not greatly out of proportion with the term actually assigned in Buddhistical history to the reigns of the three *Magadha* kings, (viz.) ;—

CHANDRAGUPTA,.....	34
BINDUSARA,.....	28
ASO'KA,.....	37

99 ÷ 3 = 33 years for the average

At all events, it must be conceded that a series of only nine reigns, comprised within so limited a term as 320 years, can by no admissible process of adjustment be extended to 703 by the addition thereto of 383 years short deducted at the age of GONERDA III. Such an addition would make it necessary either to throw back the reign of CHANDRAGUPTA to (B. C. 1182 + 703=) B. C. 1885, which would disturb the whole scheme of Hindu chronology, or to bring the reign of GONERDA III. (B. C. 1502—703) to B. C. 799, which KALHA'NA had not done.

It appears to be requisite, therefore, that the adjustment made in the date of the reign of GONERDA III. should be nearer 1177 than 794 years; and, indeed, I conceive I am justified in asserting, that this position admits of almost arithmetical verification, from the inequalities of the averages produced in the reigns of the three *subsequent* "dynasties" in the Chronological Table of the *Rája Tarangini.*

It will be seen in that Table, that Professor WILSON does not escape from his chronological embarrassments till the close of his "third dynasty;" as the averages assigned to two of those dynasties are, by his own acknowledgment, inadmissible. According to his *corrected* chronology he has

In the first dynasty, ..	21 Princes in	378 years,	average 18 years.	
In the second dynasty,	6 ditto in	192 ditto,	ditto 22 ditto,	8 months.
In the third dynasty,	16 ditto in	433 ditto,	ditto 43 ditto,	3½ ditto.
	37	1003 general average 27 years, 1 month.		

If, instead of resting these adjustments on conjectural grounds, we substitute the precise correction ascertained to be necessary in Hindu chronology at the reign of CHANDRAGUPTA, being about 1177 years, we shall then bring the reign of GONERDA III. from B. C. 1182, down to B. C. 5. The general average of the reigns of the 37 Kashmerian princes from GONERDA III. in B. C. 5 to the end of the reign of BA'LADITIYA in A. D. 615, will then give the satisfactory result of 16 years and 9 months. The necessity of all further adjustments of the Cashmirian table, subsequent to the age of GONERDA III. will be thereby got rid of. The clumsy expedient of KALHA'NA Pandit for making those adjustments, by assigning preposterously protracted terms,—in one instance of 300 years,—to the reigns of the princes of the three subsequent "dynasties," may at once be rejected. *His* chronology down to the reign of GONERDA III. will be rendered consistent with the Puránas; and *our* adjustments will be in accordance with the anachronism ascertained to exist in the age of CHANDRAGUPTA.

As regards the Buddhistical chronology, I have it in my power to adduce *direct* evidence, independent of *hypothetical* reasoning, in support of the proposition which I have advanced.

It can hardly be necessary for me to bring forward proofs, beyond those exhibited in the foregoing extracts from Professor WILSON's Essay, to establish, that ASO'KA, "to whom the crown of *Cashmír* reverted on the demise of SACHINARA without issue, was the *Magadha* prince of that name, the grandson of CHANDRAGUPTA and son of BINDUSA'RA, who became the great patron of Buddhism after his accession to the supreme sovereignty of India. It is found in the *Attakathá* on the *Pitakataya* (the commentaries on the Buddhistical Scriptures) as well as in the *Mahá Wanso**, that this prince administered the government of *Ujjéni*, by the appointment of his father BINDUSA'RO, the emperor of India; that he succeeded to the empire

* Vide Ch. V. As ASO'KA's son, MAHINDO, was born while his father "administered the government of *Ujjéni*," and as MAHINDO is stated to have attained his twentieth year in the seventh year of ASO'KA's rule in *Magadha*, ASO'KA must have governed *Ujjéni*, for his father BINDUSA'RO, at least fourteen years. It is immaterial, as regards the foregoing computation, whether his accession to *Cashmír* preceded or followed his accession to the *Magadha* empire, as my calculations are based on the date of the "Third Convocation" in B. C. 307.

in the year 218, after the death of SA'KYA, or B. C. 325; that he became a convert to Buddhism four years after his accession, and that the mission for the conversion of *Cashmír* was deputed by him, in the 18th year of his reign, after the termination of the third convocation, in A. B. 236 or B. C. 307. The particulars given of the rule of this prince in *Cashmír*, concise and imperfect as they are, entirely accord, as far as they go, with the foregoing sketch. According to that sketch, ASO'KA is not the direct descendant of his predecessors who reigned in *Cashmír*; "he was originally a pious worshipper of *Siva*, but subsequently invented or originated the *Jina Sásana*" (religion of *Jina* or *Sákya)*; and, according to the *Ayin Acberi*, "abolished the Brahminical rites and substituted those of Jina." With these marked features of resemblance, of peculiar and prominent importance in the tableau of Indian History, which are not recognizable in, or applicae ble to, any other Asiatic monarch, it appears to be impossible to withhold the admission that the ASO'KA of *Cashmír*, and the ASO'KA of *Magadha*, subsequently called *Dhammásóka*, the emperor of India, are identically one and the same individual.

If on this *hypothetical* reasoning, the point of identity may be considered to be established, (and I observe by your Genealogical Tables that it is there admitted,) we have to add 20 years for the residue of the reign of ASO'KA, from the date of the Buddhist mission to *Cashmír* in A. B. 235, or B. C. 307, to complete his reign of 37 years in *Magadha*, which brings us to B. C. 287, leaving a term of 282 years between that date and B. C. 5, to which the reign of GONERDA III. was brought, according to the foregoing adjustment (made on Brahminical chronological data) to be divided amongst the six princes who intervened between ASO'KA and GONERDA III. These numbers will give an average of 47 years for each reign, which is certainly inadmissible. This discrepancy, however, only serves to give me greater confidence in the views I entertain; and, indeed, if such a result was not produced, in this particular portion of Buddhistical chronology, the whole of the reasoning entered into in the introduction to my pamphlet, on which I have attempted to prove "that an intentional perversion to the extent of about 60 years has been adopted, to answer some national or religious object, which is not readily discoverable, between the date of SA'KYA SINHA's death and that of the accession of CHANDRAGUPTA," would be nullified. By deducting these 60 years, about 222 years will be left to be divided among those six princes, which gives an average of 37 years, which also is far from being a satisfactory result. But a single protracted reign, in so limited a number as six monarchs, would be sufficient

to reduce the average of the other five reigns to an admissible term, and would, at the same time, adjust the date of Aso'ka's reign in the *Rája Tarangini* to the date assigned to it in Buddhistical chronology, as well as produce the same result with that arrived at by the foregoing adjustment of the Brahminical chronology,—viz. fix the age of Gonerda III. to about B. C. 5.

In the translation of the foregoing *Sanscrit* quotation, on the authority of which Professor Wilson's adjustment of the age of Gonerda III. from B. C. 1182 to B. C. 338 is founded, I have ventured to make a few verbal alterations, unconnected with the date, in conformity with the meaning which Buddhistical phraseology would suggest. From the context with the other portions of the work, it may be perfectly just to apply the term "*pravrajyarjita*" to "Bauddhas" exclusively; and M. Csoma de Körös corroborates, from Tibetan authorities, the inference that these Tartar princes were of the Buddhistical faith. But that term in Buddhistical literature signifies, in the most general sense, "ascetic," without distinction of any particular religion. The impression conveyed to my mind by this passage is rather to the effect that "*Cashmir* was under the spiritual controul of (Brahminical) ascetic sages, eminent for their rigid piety," than that "*Cashmir* was the enjoyment of Bauddhas eminent for austerity" during the reigns of the three *Turushka* princes.

The correction made by Professor Wilson from "*Puranirvritté*" to "*Parinirvrité*" is indispensable; and had the Burma priest, whom he consulted, called to his recollection that *Majjhantiko théro* did not repair to *Cashmír* for the purpose of converting it to Buddhism, until 236 years *after* the death of Sa'kya Sinha, he would doubtless have also pointed out that, according to Buddhistical authorities, there was as great an irrelevancy and inadmissibility involved in the specified date of 150 years, as in computing that date "*anterior*" instead of "*posterior*" to the death of Buddha.

This manifest inaccuracy is to be rectified by prefixing "*d*" to the "*sárdhan varsha satan,*" and converting it into "*dasárdhan varsha satan**." In making the addition of this single letter, it must not be

* I should here note that I have never met in my *Páli* reading, nor has any native scholar been able to refer me to, the numeral "*Saddhan-sata*" for "one hundred and fifty;" although, according to grammatical rules, the contraction of "*Saha-addhán-sata*" into "*Saddhan-sata*" appears to be perfectly admissible. Whereas the numeral "*Dasaddhasata*" contracted from "*Dasa-addhán-sata*" for "half a thousand," is in continual use. It is repeatedly met with in the *Maháwanso*, Ch. I. "*Sámuddé Nágabhawané dasaddhasata yójané.*" "In

regarded as an arbitrary alteration on my part. It is a correction, the adoption of which cannot be resisted without impugning the authority of authentic Buddhistic history, in which "Na'ga'rjuna" (as Professor Wilson himself surmises) under the name of "Na'ga Se'na" enjoys a distinguished celebrity. He does not appear ever to have visited Ceylon, and as the *Attakathá* extant here only comprise a *continuous* record of Indian events up to the period when the third convocation was held in A. B. 236 or B. C. 307, while he himself flourished in A. B. 500 or B. C. 43, the only record of Na'ga' Se'na in this island, (as far as I am aware,) excepting some unconnected allusions to him in *Buddhaghósós Attakathá*, is the *Milindapanno* (commonly called *Milinapprashno)*, a work which derives its title from his dialectic controversy with Milindu the rája of *Ságalá*. In that work, from which I shall presently make some extracts, it is specifically stated that he appeared (in fulfilment, of course, of an assumed prediction of Sa'kya Sinha) *five hundred* years after the death of Buddha; and that work, moreover, contains the names of the *six Arhatwas*, (Páli *Arahantá,)* who, most fortunately for the illustration and substantiation of my case, are referred to in the four apparently insignificant words with which this *Sanscrit* quotation concludes. In Professor Wilson's translation of these four words, the negative "*na*" has been overlooked, and he has rendered them into "he was the asylum of the six *Arhatwas*," instead of translating them "he did not recognize," i. e. he denounced, "the six *Arhatwas*."

With these explanatory remarks, I venture to offer the following translation of this valuable *Sanscrit* quotation.

"They (Hushka, Jusrka, Canishka) of *Turushca* descent, were princes asylums of virtue, who founded colleges and chetiyas in *Suscha* and other countries. During the entire period of their rule, the whole of *Cashmír* was under the spiritual controul of ascetic sages, eminent for their rigid piety. Thereafter, when (half a thousand) five hundred years had elapsed in this (land), as well as the whole world, from the period that the sanctified Sa'kya Sinha attained *Parinirvrittí*, the pre-eminently endowed *Bódhisatwa*, Na'ga'rjuna, became the (spiritual) lord of this and many other lands, and did not recognize (i. e. denounced) the six *Arhatwas* (who were his contemporaries)."

a Nàga kingdom, half a thousand (five hundred) yójanas in extent, bounded by the ocean." Ch. V. "*Purisánán dasaddhéhi satéhi pariwarito :*" "attended by retinue of five hundred men." I am not aware whether this remark be applicable to the *Sanscrit* language also; nor does it appear to me to be material, as Kalha'na probably quotes from a *Pali* Buddhistical work.

The general history of NA'GA SE'NA, to which the *Milindapanno* refers, although it *could* throw no light on the history of Buddhism in Ceylon, in as much as Buddhism was established in this island 264 years *before* the period of his ministry, and as he himself never appears to have visited it, is nevertheless a work, the value of which, as regards the Buddhistical history of India, cannot well be overruled, and for the recovery of which, if still extant in the regions mentioned by Colonel TOD and Lieutenant WEBB*, no pains should be spared. It is reasonable to infer, from the tenor of the *Milindapanno*, that his triumph over MILINDU rája was either his principal achievement, or that which most contributed to his renown; but the mention made of him in the *Rája Tarangini* presents conclusive evidence of the sphere of his influence and ministry not having been confined to that triumph; and the circumstance of the *Milindapanno* commencing with a quotation from a more general work, affords equally conclusive proof that such a history of his life had once been extant. The *Milindapanno* being incomplete, neither the date at which, nor the individual by whom, it was compiled from pre-existing works, is specified in it. The following is a literal translation of its commencement.

"Adoration to him, who is the sanctified, the deified, the omniscient, supreme BUDDHA!

"In the capital city, *Ságalá*, MILINDU approached NA'GA SE'NA, as a river approaches the ocean. That monarch having selected him who was endowed with the power of enlightening the darkness of ignorance, as if he were a meteor-bearer, proposed certain profound questions (to him) involving the great principles of right and wrong."

"There (in reference to that quotation) do ye (my hearers) devoting your undivided attention to, and preparing your minds to be favorably impressed with the subject, listen to these profound and doubt-dispelling dissertations, which, as well from the questions suggested as from the solutions rendered, their deep import, and connected consistency, their influence over the passions and charm to the ear, (are) unprecedented, and make the hair stand on end (with amazement); portraying them, from the similitudes and parables used by NA'GA SE'NA, as if immersed in the (waters of) the '*Abhidhamma*' and '*Wineyo*,' secured (at the same time) in the meshes of the net of the '*Suttans*.'

"The subject may be thus set forth in due order."

After describing the magnificence of *Ságalá*, and giving an account of both NA'GA SE'NA and MILINDU in a previous existence, the former as a *Samanero*, and the latter as an *Upasampada*, the narrative thus proceeds.

* Alluding to the existence of an extensive Bauddha library in *Jesalmir*. The rája of this country is, we hear, passionately addicted to turning, and might barter all his books for a good lathe!—ED.

"Thereafter, in whatever manner the appearance of the 3*rd** *Maggaliputtatisso* was foreseen by our *Bhagawá*, in the same manner (the appearance of) these two personages also was foreseen by him, for he had thus predicted: 'Five hundred years after my *Parinibbánan* they will be born. Whatever discourse there may be propounded by me, which, from its conciseness may appear entangled and confused, these persons will, from the mode in which they will conduct their interrogation and illustration, thoroughly unravel it. Of these persons, the Samanéro will be born in the character of Milindu rája in *Ságalánagara* in *Jambudipa*, accomplished in learning, skilful in conduct, gifted with judgment, powerful abroad; who, both in the conception and execution of his designs, whether regarding the past, the future or the present, will exert a sound and deliberate judgment. To him many endowments will be attainable, viz: the 'Súte,' 'Sammati,' 'Sankhya,' 'Yóga,' 'Níti,' 'Widésika,' 'Gana ká,' 'Gandamba,' 'Tikechchha,' 'Chatubéda,' 'Purána,' 'Itihása,' 'Joti,' 'Máyá,' 'Hétu,' 'Mantaná,' 'Uddhá,' 'Chhanda,' 'Samuddha.' He will be capable of confuting sages versed in the nineteen védas, invincible from his own gifts, and held in universal estimation, even of those of antagonist creeds. In the whole of *Jambudipa*, there will be no one comparable to Milindu rája, in the aforesaid particulars of power, energy, enterprise, and wisdom. He will be endowed with riches and worldly prosperity; and guarded by military power in a state of the utmost efficiency.'

"On a certain occasion, Milindu rája, desirous of inspecting his military array, composed of every branch of the four constituent hosts of an army, proceeding out of the capital, and having caused them to be counted; this monarch, a profound disputant, and versed in the phraseology and science of those learned in the 'Sakáyata,' looking at (the position of) the sun, thus addressed his attendant officers of state: 'There is a long day before us yet: how shall we pass it? Were I to return instantly to the town, is there any sage, whether sacerdotal or bráhman, the head of a great sect, having a fraternity of his own, and being a preceptor himself, who maintains that he is *arahat* and an omniscient Buddha, who would be willing to enter into a disputation with me, for the purpose of solving doubts.'

"On having thus expressed himself, his five hundred *Yonaká* (chiefs) replied to Milindu rája in these words: Mahárája! there are six (such) viz: †*Puránarkassapo, Mokkhaligósálo, Nigunto-náthaputto, Sanjágo bélatti putto, Ajitakésakambali,* and *Pákudokachcháyano,* who are heads of great sects, having fraternities of their own, and are preceptors themselves, of great celebrity, having numerous congregations, sectarians in

* Vide Chapter V. *Maháwanso* for this prediction.

† These are also the designations of certain contemporary disciples of Goutama.

principle, the elect of a great portion of the human race. Mahárája! seek them; enter into a controversy (with them) and solve doubts."

The narrative proceeds to describe the disputation of MILINDU, first, with *Puráṇa-kassapo*, and then, with *Makkhaligósálo*, and represents that as the monarch confuted them and similarly overcame every other disputant, all the *arahat* priests absented themselves for twelve years from *Ságalá*, and retired to the vicinity of the *Rakkhitatalo* mountain in the *Himawanta* regions. At the intercession of ASSAGATTA théro, in behalf of the Buddhistical priesthood generally, SAKKHA, the supreme of déwas, is represented to have invoked NA'GA SE'NA, who was in the *Kétumati* heavens, and called MAHÁ SE'NA, to be born in the human world, for the purpose of confuting MILINDU; to which NA'GA SE'NA ultimately consented. Accordingly "he is conceived in the womb of the wife of the bráhman named SO'NUTSARA, an inhabitant of the village *Kajangalla* on the borders of the *Himawanta* mountains," and becomes highly accomplished and perfect master of the three *védas*. Doubts are then engendered in his mind as to the correctness of the doctrines contained in those *védas*. While in this frame of mind, ROHANA théro, as predestined, enters into a controversy with him, converts him, and removes him to *Rakkhitatala*. There he is admitted into the "*Samanéra*" order of the Buddhistical priesthood, and acquires the *Abhidhammapitaka;* and is ordained an "*Upasampada*" priest at the age of 20 years. He is next placed under the tuition of ASSAGUTTA théro, apparently in the same village, for three months, where he first attains the sanctification of "*Sótápatti.*" At the termination of this period, he is sent to place himself under the charge of DHAMMARAKKHITA théro of the *Asókárámo temple** in *Pataliputra*, which is stated to be distant "one hundred yójanas" from *Kajangalla*, the birth-place of NÁGA SE'NA. On the road he meets with a *Setthi*, who was travelling also to *Pataliputto*, with a train of five hundred carts. This *Setthi* maintains him on the road, and hears his discourses propounded from the *Abidhamma*. At *Asókáráma vihára*, in the course of three months, he acquires the *Pitakattaya* by heart, and in three more, masters their import, and attains "*Arahat.*" He is then summoned to appear before the *Arahat* priests, who had retired to *Rakkhitatala* mountain in *Himawanta;* and he repairs thither. He is there enjoined by these Arahat priests to proceed to *Ságalá* and cope with MILINDU rája, whose triumph over all other théros had driven them to the *Hima-*

* Vide Ch. V. of the *Maháwanso*, for the construction of this temple, by DHAMMA'SO'KA.

wanta. He consents to undertake the enterprize, confident of overcoming him, and all other opponents; and advises the rest of the *Arahanta* to precede him thither, without fear. They do so, and *Ságalá* is represented to "glitter with yellow robes again." MILINDU then enters into a disputation with AYUPÁTA théro of *Sankhéya parivéna,* on the question as to whether the priesthood possess any spiritual advantage over lay ascetics, resulting from their ordination. It does not clearly appear whether AYUPÁLA is one of the priests who came from *Himawanta* or not, but he is also confuted by the rája. The royal suite, composed of the aforesaid five hundred *Yonáká* nobles, do not participate, however, in the monarch's exultation, and attribute the discomfiture of the théro to his individual incapacity. At this particular juncture, NÁGA SE'NA makes his appearance in *Ságalá,* and establishes himself at the *Sankéyapariwéno* with a sacerdotal retinue, which is exaggerated into 80,000. The *Milindapanno* then proceeds to describe the preparation for, and the actual interview between MILINDU and NÁGA SE'NA, quoting occasionally from the work before referred to. MILINDU, on this occasion, loses his former confidence in himself, both from the fame of NÁGA SE'NA's reputation, which had already reached him, and the composure with which he received him. It is finally agreed upon, that the disputation shall be carried on in the king's palace, in the presence of ten selected théros. The disputations are then entered into accordingly. The *Milindapanno* extant in Ceylon contains 262 dissertations, as well as the designations of the dissertations that are missing, being 42. In the Singhalese version of the *Milindapanno,* from information stated to be derived from a *Tíká* brought from *Siam,* which I have not met with, it is mentioned that these dialectics terminated in MILINDU becoming a convert to Buddhism, then a priest, and ultimately an Arahat.

These extracts and abstracts, whether viewed in connection with the events recorded in the Cashmirian history, which also bear testimony to the partial subsidence of the influence of Buddhism in Northern India, and of the congregation of the heads of that faith in the neighbourhood of the Himálayan mountains about the third century B. C., and the subsequent revival of that influence in the days of NÁGÁRJUNA and the *Turushka* princes, who are likewise represented to have resorted to *Cashmir* from the same quarter; or whether we regard them in connection with the incidents contained in the history of *Buddhaghóso* in the fifth century of our era, as illustrated in my pamphlet, together with the data contained in Tibetan annals as noticed by Mr. CSOMA, are replete with historical importance and engrossing interest. I shall not, however, venture to speculate

on data, which are as yet but imperfectly analyzed, and on the authenticity of which oriental scholars have still to form a judgment.

Reverting, therefore, to the consideration of the Cashmirian Chronological Table, I have to observe, that according to the *Milindapanna*, NÁGA SE'NA flourished *about* 500 years after the death of SÁKYA SINHA, or B. C. 43. If his visit or mission to *Cashmír* took place towards the close of the reign of the three *Turushka* princes, the rule of their immediate successor, ABHIMANYA, who restored Bráhminism in *Cashmír*, must also have *commenced about* the same date. By your Genealogical Tables, that monarch reigned 35 years, which term deducted from B. C. 43 leaves B. C. 8; being nearly the same date as those to which I arrived, by the two foregoing computations, in which I have attempted to reconcile my adjustment "to the most approved data as yet established in both the Bráhminical and Buddhistical chronologies."

The next and last source of evidence of which I have to avail myself, is derived chiefly from your valuable researches in numismatalogy. At the end of the second volume of Lieutenant BURNES' travels into *Bokhára*, some observations are furnished by Professor WILSON and yourself, on one of the Bactrian coins found by that enterprizing traveller, and portrayed in the engravings attached to his work*.

The points you seek to establish in regard to this coin are, that it belongs to KANISHKA, one of the three *Turushka* princes above named; and that he reigned "near the end of the second century B. C." and these points are apparently corroborated by the foregoing date assigned for the age in which NÁGA SE'NA lived, viz. about B. C. 43. By your Genealogical Tables these princes are represented to have reigned, synchronously about 60 years: that computation, also, will bring the *commencement* of their rule to B. C. 43 + 60 = 103 B. C. or "near the end of the second century B. C."

* See the second volume of the Journal, page 314. Most of our readers are aware that the date assigned in our notice of Lieut. BURNES' coin, was afterwards in a measure abandoned, on the ground of its being found in association with Sassanian coins of a much later period.—The reading of the letter P in KANHPKOΣ was also confirmed by a multitude of specimens. No argument, therefore, can safely be built on the evidence of this coin as to the period of NA'GA'RJUNA'S mission, but there remains ample authority without it in the written history of the Buddhist church.—The typographical error in Mr. WILSON'S Chronology of Cashmir I could not fail to perceive when drawing up my own tables; but for the reason above given, I did not think it worth while to notice it.—ED.

I cannot, in this place, forbear noticing that, misled by a slight derangement of type in the impression of the Professor's Chronological Table, you have also in this note been betrayed into making an undeservedly disparaging remark in respect to Buddhistical as compared with Brâhminical chronology. Under the impression that the date assigned in the *Rája Taranginí* to the termination of ABHIMANYA's reign was B. C. 118, you consider the accuracy of that chronology to be erroneously impugned by being thrown back to B. C. 388, by Professor WILSON, in deference to Buddhistical authority. The date assigned for that reign, however, is not B. C. 118, but B. C. 1182, in the *Rája Taranginí;* and by that adjustment, *made on Buddhistical authority*, though the correction, from the circumstances explained, is insufficient, still an *important and valuable correction is effected to the extent of* 794 *years!*

I have thus, from four sources of information, totally unconnected, arrived at one and the same conclusion, corroborative of the authority of the *Milindapanno*, on which I have added the single letter "*d*" to the numeral "*Sárdhan-satan.*" The chronology of the *Rája Taranginí* is brought, by the first, to coincide with the adjusted Hindu chronology in the *Puránas*—by the second with the *Attakathá* of the *Pittakataya* and the *Mahâwanso*—by the third with the age of NÁGÁRJUNA, or NÁGA SE'NA, as given in the *Milindapanno*, and the revised *Sanscrit* quotation from the *Rája Taranginí:* and by the fourth, with the age of the coin of KANISHKA; with Tibetan authorities adduced by Mr. CSOMA; and with the epoch of the overthrow of the Bactrian dynasty, as given by SCHLEGEL and other authorities.

In computations of this nature, exact precision is not to be attained, or expected. In specifying the age of NÁGÁRJUNA, in such round numbers as 500 years after the death of SÁKYA, it is manifestly an approximating rather than a specific date. If from the general tenor of the *Rája Taranginí*, and the Tibetan authorities referred to by M. CSOMA, it be clearly shown that the *Turushka* princes were Buddhists, and that NÁGÁRJUNA appeared in *Cashmír* during their dynasty, the only alteration rendered necessary in the foregoing computations, would be that his visit to *Cashmír* should be considered to have taken place about 460 instead of 500 years after the death of SÁKYA. Mr. CSOMA's unpublished life of SA'KYA, to which you refer as containing data connected with Buddhistical history, derived from both *Sanscrit* and *Tibetan* works of the age of KANISHKA, furnishes another important and encouraging evidence of authentic annals of Buddhistical history having extended in Continental Asia beyond the age of ASO'KA.

II.—*Third Memoir on the ancient Coins discovered at the site called Beghrám in the Kohistán of Kábul. By* Mr. Charles Masson. *Dated Kábul, May,* 1836.

Two notices on the site of *Beghrám,* and of the nature of the coins found at it, have already been made public in the pages of the *Journal of the Asiatic Society of Bengal.* The collection of its antique treasures having been continued for three successive seasons, the results may be worthy of being presented in one view, both for exhibiting the exact state of discovery up to this time, and for providing data on which to found inferences or to hazard conjectures on the curious and intricate subject of Bactrian history and antiquities.

It is not the object of this memoir to convey a full account of the present state of knowledge on these and other points, upon which, in truth, light is only beginning to dawn ; but simply to narrate the fruits of our own labors, happy if they prove useful to those, who, with superior advantages, and when sufficient materials are collected, will, no doubt, favor the world with some important work. We have, therefore, only to descant upon the coins found at *Beghrám,* and such, allied or connected with them, ~~which~~ may have been procured by ourselves in *Afghánistán,* and refrain in the same spirit from the delineation of any coins not actually found by us ; and if such are alluded to, it is from necessity, and to direct attention to them.

The site of *Beghrám,* whatever its original name may have been, and whoever may have been its founder, yields evidence from the coins found at it, of its existence as a city, which must, at least, have flourished from the epoch of Euthydemus, the king of *Bactria,* to that of the Mahommedan Caliphs—or for a period of 900 years. We have speculated on the probability of its pointing out the situation of *Alexandria ad Caucasum,* or *ad calcem Caucasi,* and see no reason to change the opinion, viz. that the honor of being considered such, must be assigned to it, or to *Nilab* of *Ghorbund.* The detection of a coin of one of the Antiochi, may prove that it flourished prior to the age of Euthydemus, as it undoubtedly will have done,—and certain Hindu Brahminical coins* described as Class Brahminical, may perhaps verify that it existed subsequently to the Mahommedan Caliphs, or to the duration of their sway in *Afghánistán* :—at all events, it would appear to have been destroyed, in whatever manner, before the era, when coins with Persian legends became current in these regions ; as our aggregate collection of nearly 7,000 coins from its site, has not been contami-

* Of the Rajput, or bull and horseman groupe.—Ed.

nated with a single Persian coin—unless fig. 9. of the just noted Hindu series have a Persian legend, which may seem to intimate that the city's extinction was about the period of the introduction of the language, which may have been contemporaneous with the rise of the Mahommedan sovereignty of *Ghazni*. The coins of its princes have Persian legends, to prove which, we have inserted a silver coin of the celebrated Sultan MAHMUD: none of his coins or of his father, SABEKTEGIN KHA'N, have been found at *Beghrám*, where those of the Caliphs so numerously occur.

Although *Beghrám*, inferring from the presence of topes or sepulchral monuments on its site and in its vicinity, may be supposed at some period to have been a capital, which its name testifies, it will generally have been only a provincial capital—and this is worthy of note, because there may be reason to suspect that many of the former rulers in these countries, particularly the Greek-Bactrian princes, had distinct provincial coinages.—Certain coins of APOLLODOTUS, ANTILAKIDES, ERMAIOS and EUCRATIDES seem to countenance the suspicion.

It is presumed that coins constantly found and in number on any known spot, afford proofs of their having once been current there, and that the princes whom they commemorate, whether as paramount or tributary sovereigns, held also authority at that spot. The numbers in which coins may be found, may perhaps furnish a criterion upon which we may calculate, first generally, the duration of the dynasties denoted by the various types of coins, and next particularly that of the reign of each individual prince. A collection of one year would not furnish this criterion, a collection of many years might,—a statement is therefore annexed, of the numbers in which the several descriptions of coins found at *Beghrám* have, during three years, been obtained;—and if it be seen, that they are found annually in due numerical proportion, it may be of service in our speculations, assisted by the coins themselves. Indeed of the recorded kings of *Bactria*, the coins are found in just the numbers we might expect, and confirm what we know as to the length of their reigns; and in some other instances of unrecorded princes, their coins and the frequency or rarity of their occurrence corroborate the conjectures as to the extent of their reigns, which other accidental discoveries seem to authorize.

The coins of *Beghrám* fortunately admit of ready classification, and may be reduced to five grand classes: 1st, Greek-Bactrian; 2nd, Indo-Scythic or Mithraic; 3rd, Ancient Persian, whether Parthian or Sassanian; 4th, Hindu or Brahminical; 5th, Kufic or Mahommedan—the last class may chronologically be entitled to stand before its predecessor the Brahminical one.

These classes at once point out the general nature of the succession of sovereignty in this country, from the age of EUTHYDEMUS to the Mahommedan era. To define particular alternations and revolutions in authority, which will inevitably have happened, more knowledge is requisite than we possess, or are likely to acquire. Yet some of these may be conjectured from the faint lights discovered coins impart, and many more may become obvious, as research advances, and as we progress in acquaintance with the subject.

From the historical records of the west we learn so much as, that an independent monarchy under Greek princes was established at *Bactra*, or the modern *Balkh*, about 250 years before Christ; and from them we are led to infer that it ceased to exist about 130 years before Christ, having thus flourished about 120 years. From the same records we also learn the names of seven of its princes, THEODOTUS I. the founder, his son and successor THEODOTUS II. the usurper EUTHYDEMUS of *Megnesia*, his son DEMETRIUS, APOLLODOTUS, and MENANDER, famed for exploits in India, and mentioned conjointly with EUCRATIDES, surnamed the Great.

The actual coins, incontestible evidences, recently discovered of a multitude of Greek princes, respecting whom history is silent, not only seem to intimate that the *Bactrian* empire may have had longer duration than supposed, but farther to establish the fact, that a variety of independent Greek principalities were erected about that time in Central Asia, some of which, judging from the coins of the princes, rivalled the *Bactrian* in power and splendor. These principalities, or some of them, we infer to have endured up to the first century of the Christian era,—probably to the middle or close of the second century, about which period Greek authority would appear to have been displaced by the race of princes hitherto designated Indo-Scythic, of whom KADPHISES and KANERKOS are pre-eminent and have the precedence. Their successors appear to have ruled for a very long period, according to circumstances, independent or tributary to paramount governments in Persia or India,—perhaps very close to the Mahommedan era. We say very close, because before the last mentioned era, a Sassanian dynasty or dynasties must be introduced, and possibly may have ruled at that epoch. This speculation may be confirmed or otherwise, by consultation of the Arabian historians, some of whose works will doubtless inform us from whom the armies of the Caliphs wrested these countries. *Beghrám* has not yielded one coin of the Arsacides, or one coin that we dare positively to affirm to be Parthian. Coins with the Sassanian symbols on the reverse, or the distinguishing fire altar, are very numerous; but it may be questioned whether they are

coins of the Sassanides of *Persia*, and whether they may not rather refer to distinct princes, that we believe Persian authentic history attests to have flourished in these countries, as at *Zabulistán*, &c.

The characters of the inscriptions on the *Beghrám* coins, some of which command attention from their peculiarity, may be also useful in determining the periods at which particular dialects ceased and became used in *Afghánistán*. The earlier Greek-Bactrian sovereigns, as EUTHYDEMUS, being guided by coins hitherto found, placed on their monies only Greek inscriptions; some of their successors, as EUCRATIDES, have coins bearing in the same manner only Greek legends, and others exhibiting both Greek and native legends; while others, and the majority of them, as APOLLODOTUS, MENANDER, &c. have on their coins invariably both Greek and native legends; no one coin of these sovereigns having been met with bearing simply a Greek inscription. The opinion might be advanced, that native legends were first adopted by those princes who extended their empire by the acquisition of distant provinces, and their absence on the coins of EUTHYDEMUS will not controvert it, as it is nearly certain that he could have carried his arms across the *Causasus* or *Hindu Koosh*, only towards the close of his reign. Another question will then arise, whether the characters of these native legends refer to a language common in *Bactria* or the countries north of *Caucasus*, or prevailing only in the Indian provinces south of it:—the latter may be suggested, by those who suppose MENANDER to have ruled in India before he conquered *Bactria*; for if he did, so did APOLLODOTUS; and on the coins of these princes, these characters will then be first noted. It is not, however, positive that MENANDER preceded EUCRATIDES; for although generally believed, the scant historical data left us are as much against the belief as for it. The language itself, that of this part of Asia, two centuries before Christ, will not have become obsolete until the period or nearly so of the Mahommedan era; for although the coins of KADPHISES, whose epoch we would fain believe was about 200 A. D. are the latest apparently which exhibit them,—excavations near *Jelálábád*, in the burial grounds of the ancient *Nagara*, have elicited inscriptions in the same character, which may safely be assumed to have been deposited at some period within the century preceding the Mahommedan era. Indeed, if the famous *Manikyála* tope be an erection subsequent to this era, as we suspect to be proved by some of the coins extracted from it, the language may have continued in use to a much more recent period; and all these circumstances may be adduced to support the opinion, that it is of Indian rather than of Bactrian origin. Mr. PRINSEP has admirably commenced the investigation of

this novel language, and to assist in the attainment of an object, from which so much advantage is likely to be obtained, we have, following that gentleman's plan, given the names, titles and epithets of the Bactrian kings, &c. as we find them on coins before us. This might have been more satifactorily done, had we, for the purpose, taken full advantage of all the coins which have passed through our hands : but as they have been transferred only to receive superior attention, the matter occasions no regret, and is noticed to excuse individual neglect in this instance and in another, viz., the passing slightly the characters on our Sassanian coins, which, while they exhibit some varieties, appear singular and different from the ordinary forms of *Pehlevi*.

The coins of AGATHOCLES and PANTALEON have native legends in another peculiar character, essentially distinct from that found on the coins of the other Bactrian princes, and both of them on every account must stand high in the royal lists of these countries. The character, Mr. PRINSEP suggests, is that of the inscriptions found on the columns of *Delhi* and of other places in India,—a character also that of the coins of the early *Canouje* princes, and singular it is that a connection may be traced between these coins and those of AGATHOCLES and PANTALEON.

About the period, or a little anterior thereto, of the Mahommedan invasion, we find the first traces of Nágari, but on coins which we are not positive were current at *Beghrám*. The Caliphs introduced *Kufic*, shewn by their coins, and on the inscriptions of the columns at *Ghazni*, the seat of their government. To them succeeded in authority the Brahminical sovereigns, as we suppose, whose coins have again Nágari legends, and these were expelled by the Mahommedan princes of *Ghazni*, when modern Persian became the general and written language of the country, as it remains to this day.

It may be proper to note, how tenaciously the Greek language was preserved on the coins of this country, up to a period within a century or two of the Mahommedan era, and employed by the whole series of Indo-Scythic kings excepting KADPHISES, to the exclusion of the native dialect. While there is sufficient testimony that the Greek language was studied and well known by the fashionable and higher orders in India during the first and second histories of the Christian era, the latter coins of the Indo-Scythic princes seem to testify, by the very corrupted characters they bear, that at the period of their coinage the knowledge of it was very trifling, or limited to the power of determining the value of its letters,—Greek artists would then have been out of the question ; and without some such knowledge it is diffi-

cult to conceive how Indian artists could have arranged in Greek characters such words as AΘPO, MIOPO, ΦAPO, OKPO, &c. The respect so obviously shewn to the Greek language may suggest the opinion, that coinage was considered eminently a Grecian art, and corroborates the notion that the Macedonians introduced it into these parts of Asia.

The several devices of the Bactrian coins, whether Greek or Indo-Scythic, are interesting from their variety, and instructive from the information they convey as to many points, particularly the religion of the times. Of the Greek, some display the deities of the classical Grecian mythology, as Jupiter, Minerva, Apollo, Hercules, &c. represented in the attitudes, costumes, and with the attributes commonly assigned to them in the West;—some have animals, as elephants, horses, bulls, camels, &c., from which may be implied localities of rule; others have warlike devices, as horsemen at charge, seeming to indicate the personal character of the prince, and others appear to commemorate some remarkable incident in his career, as victory presenting a chaplet, or a figure trampling upon a vanquished foe. The Indo-Scythic coins have universally devices, whose accompanying inscriptions, as fully and satisfactorily shewn by Mr. PRINSEP, prove to be personifications of the sun and moon. It may excite surprise that the peculiar religion to which such personifications refer, should have been so exemplified on the coins of princes, whom we have considered of the Buddhist faith. It was, nevertheless, the religion of old standing in these countries, the supremacy over which, if acquired by Buddhist or Indo-Scythic princes, will have been acquired, as supremacy ever is, by conquest. Of this ancient religion, besides the evidences furnished by coins, we have that afforded by the temples and places of sepulture. That the Buddhist faith also prevailed, while agreeable to historical record, is not contrary to hypothesis; and the conquerors of that persuasion may, from policy, have placed on their coins the emblems of the national religion of the vanquished. As Buddhism will also have gained ground by a correspondent decline of strength in the religion which preceded it, it is natural that superstitions and observances of both should be blended.

The regions spreading from the source of the Oxus have claims to be considered the birth-place of that peculiar form of the Mithriac religion, which was at one time adopted in all the countries between the Indus and the Bosphorus—and of which vestiges are still seen in the temples and sepultures of its votaries. *Persia* presents the superb proofs of it in the wonderful ruins of *Persepolis*, and *Afghánistán* displays them at *Bamián*. Numerous are the places of minor considera-

tion in *Afghánistán*, *Turkistán*, and *Badakshán*, which were alike sacred, but in a less degree, which yet plainly indicate the strongholds of the faith they commemorate. The distinguishing feature of these sacred places is the *samach*, or cave, always found with them, and which decides the identity in character of the honey-combed hills of *Bamián* in *Afghánistán*, and those of *Tilmissus* in Asia Minor. It is affirmed in the *Ayin Akberi*, that there are 12,000 of these samaches in the hills of *Afghánistán* :—the number is not overrated. There is no reason to suppose that they were ever the residences of a multifarious community, engaged in the ordinary occupations of life ;—it is obvious, that they were the abodes of priests and ascetics connected with the temples of religion and sepulchral monuments. So plain is this fact in *Afghánistán*, that, if a solitary *samach* or cave be discovered, it is merely necessary to employ the privilege of sight to detect the mound or tumulus relating to it ; and vice versâ, if a tumulus be first descried, the sight directed to the nearest eminence will not fail to discover the cave or caves belonging to it. It is always the case, that these monuments and caves are found at the skirts of hills, shewing that they were remote from the inhabited villages, then as now, and in conformity to the spirit of asceticism, enjoined by the religion of the day. It need not, therefore, be deemed that the caves of *Afghánistán* were the dwellings of a rude Trogloditic nation ;—on the contrary, they are works of art, the results of vast labour and expenditure, and must have been formed under favorable circumstances of national prosperity. Let no one imagine he beholds in them the retreats of the Mardi. The most prominent of the sepulchral monuments of *Afghánistán* are unquestionably its topes or royal cenotaphs with their tumuli : the latter so perfectly agree in form with the Buddhist *dehgopa* that it would be difficult not to allow them to be the same thing. The most ancient of the cenotaphs hitherto examined in *Afghánistán* does not appear to attain the antiquity of the Christian era,—most of them certainly fall much short of it : it is true that every tope has its caves, but there are caves, as in the conspicuous instance of Bamián, which have not topes : Bamián*, like every other spot

* There is an error in our account of the site of Alexandria ad calcem Caucasi, contained in our memoir of 1834 relative to the river of Bamián, which it is necessary should be noted. We have made that river pass by *Ghorband*, which we supposed it did, contrary to the reports of the natives—they are correct, and the river flowing northerly falls into the stream of *Kundúz*. PTOLEMY, we believe, has an upper and a lower Nilábí, when noting the country about *Alexandria* ; and they can scarcely be other rivers than those of *Ghorband*, and *Puryshir*.—May, 1836.

in *Afghánistán*, has its mounds or ancient burial places. The cave temples may therefore be considered, in some instances, more ancient than the topes, whose age is within the reach of verification; and while it may point to the period of the introduction of Buddhist sovereignty in *Afghánistán*, that of the cave temples must be carried to the period when the religion, in whose service they were constructed, had its rise or was pre-eminent. Of this religion the Guebres are, at this day, evidences, as are possibly the inhabitants of *Cafferistán*. Asceticism, of which every case presents a memento; while a distinguishing feature of primitive Buddhism would be also a condition of the more ancient Mithriac faith; for

"La religion a toujours produit des solitaires."

Reverting from this digression to the coins to which the term Indo-Scythic was once considered so aptly applied, and whose sovereigns we had considered, in deference to historical evidence, to have been of the Buddhist religion, if it should be ultimately found that they were of another faith, yet the Buddhist religion will have been widely disseminated in *Afghánistán*, the images of Buddha and other idols to be found in abundance being accepted as proof. The apparent traces of the faiths of Mithra and Buddha observable in the antiquities of the country, are only natural consequences;—in like manner, at *Moscow* before its destruction, might be seen the mosques of Mahommedans surmounted by the cross, as at the present day at *Constantinople* may be witnessed the temples of Christianity surmounted by the Crescent. The terms applied to designate the sun and moon on these Indo-Scythic or Mithraic coins, may suggest some reflections, some of them appearing to have been derived from the West, as HAIOC, NANAIA, ΦΑΡΟ, &c. and others from the east, as MAO, OKPO, &c.

We had hoped to have obtained a sufficient quantity of coins from some known spot north of the Caucasus, which could not fail of throwing additional light on Bactrian numismatology; but not having been able personally to attend to the point, dependence upon others has hitherto frustrated our object. Even at *Beghrám* we have not met with all the coins that probability would lead us to expect; at least we dare not appropriate any of them to the *Pandava* dynasty, which governed in the *Paropamisus* at the period of the invasion of ANTIOCHUS the Great. It is but reasonable to suppose that after the Macedonian invasion, all the native princes had distinct coinages, and, of course, this dynasty among the rest. Greek historians have preserved the name of SOPHAGASENUS, who established himself in the *Paropamisus*; and Sanscrit records, as Colonel TOD informs us, gives the name of his son GAJ, both valuable; Gaj accounting for the etymology of *Gaj-*

ni, or as now called *Ghazni*; and SOPHAGASENUS, shewing the name both of the prince and of his nation. The former, Colonel TOD tells us, was *Subhav* or *Subhag*; and as for the latter, we learn from PLINY that the ASENI peopled three cities, their capital being *Bucephalia*; the ruins of this city may still be seen on the Jèlum river, in the Panjáb, and the Yadu or Yidu hills, from which SUBHAV issued on his career of conquest, still preserve their ancient name in *Jid* or *Yid*. This branch of the *Pandava* family being cotemporaneous with EUTHYDEMUS of Bactria, who is supposed to have deprived it of sovereignty in the person of Rája GAJ; it is evident, that the sway of the two first Bactrian kings, THEODOTUS I. and THEODOTUS II. did not extend south of the Caucasus;—it also is manifest that EUTHYDEMUS could have established his sway over the *Paropamisus* only towards the close of his reign; for at the time of the expedition of ANTIOCHUS, SOPHAGASENUS, as the Greeks have it, the father of GAJ, was living. PLINY in mentioning the ASENI, is speaking of the nations which inhabited the modern Panjáb, but it is probable that he gives the information he derived from authors who flourished two or three centuries before him; and this remark may correctly apply to all he advances upon India. His observations on Bactriana, Marginia, &c. he avows to have collected from DEMONAX; his testimony is not the less valuable on this account, and this slight notice of the ASENI, leads us to the knowledge, that the kingdoms of PORUS and TAXILES had been subverted or had passed into other hands, that the PANDAVAS had possessed themselves of the hilly regions, west of and contiguous to the *Acesines*; and that *Bucephalia* had risen into importance, and had become the capital of a dynasty.

We had nearly omitted to refer to the monograms of the *Beghrám* coins. The Greek-Bactrian have chiefly alphabetical ones, which conceal much information, never likely to be ascertained. As the same monograms occur sometimes on the coins of more than one prince, they may be presumed monograms of locality, and may be useful to establish a connection, when other indications are wanting. The Indo-Scythic coins have also monograms, but not alphabetical ones, being apparently emblems of authority and religion.

We refrain in these preliminary observations from many speculations to which the subjects referred to might lead,—because it is possible that future discoveries may tend greatly to clear up the difficulties which attend our present investigations into the antiquities of *Bactria*, and which may induce very different conclusions from those we now arrive at by conjecture. In the memoir of last year we indulged too freely in such speculations, which occasions regret. Nevertheless, in

the subsequent analysis, we have ventured to point out the ideas that have suggested themselves upon reviewing each particular species of coin, not that they may be implicitly adopted, but under the hope, that while liable to correction, they may conduce to promote inquiry and elucidation, and this perhaps is all that can be done until our knowledge is more matured*.

Kabul, December 31, 1835.

NOTE.—After writing these observations, a copper coin of one of the *Arsakian* princes apparently, has been picked up, in which the obverse legend is in the exact corrupted characters of the Greek legend of the Kadphises coin, the basileus and the first letters of basileôn being distinct: while the reverse legend presents the characters we call Bactrian, but not so clear from the coin being worn, as to allow their transcription with any advantage. Of the characters there is no doubt.

* Mr. MASSON confesses in this memoir that he has been too ready on former occasions to draw inferences which subsequent researches have either failed to confirm or have overthrown. The more he avoids such speculations, the more confidence will be placed in his results, because they will be freed from the suspicion of any bias. We could not, however, have ventured to prune his essays without danger of cutting off what was really valuable, or of robbing him perhaps of some happy conjecture which might hereafter prove well founded. On the same grounds we have formerly allowed names to stand on his list, (like *Ausios*, &c.) which were evidently wrong, and which his further search has led him to correct. His present elaborate memoir is hardly free from the same objection, for it is yet too early to generalize: nevertheless we do not like to keep back a line of his introduction, replete as it is with valuable information. The list of coins to which it is a prelude includes the whole of his former collection, with the additional light thrown upon them by other essays published in the Journal. It would be an useless and expensive repetition to republish these drawings at length, especially when we have not the coins themselves to engrave from.

We trust, therefore, the author will excuse our limiting an insertion of figures and descriptions to those that are new in name or in type. At the same time we shall take the opportunity of adding a few coins from M. COURT'S excellent drawings, as well as, with permission, some of KERA'MAT ALI'S second dispatch (lately purchased by Dr. SWINEY) which have not yet appeared: always keeping in view the arrangement of our engraved plates for a general compilation on Indian Numismatology hereafter. Mr. MASSON'S coins have, we presume, long since been despatched to the Hon. Court of Directors through Col. POTTINGER, and we have little doubt that accurate engravings of the whole will there be made by the new ruling machine. We must not omit to make public, that Col. POTTINGER most courteously offered to send them all for our inspection en route to England, but we felt it unfair thus to detain them on their journey, while we had Mr. MASSON'S ample investigation before us.—ED.

Enumeration of Coins collected from Beghrám during the years 1833, 1834, *and* 1835.

	1833.	1834.	1835.
Greek Syrio-Bactrian.			
Antiochus	0	0	1
Recorded Greek Bactrian.			
Euthydemus	1	2	3
Apollodotus	19	31	23
Menander	39	56	58
Eucratides	70	92	107
Unrecorded Greek Bactrian.			
Pantaleon	2	2	3
Agathocles	10	19	14
Lysius	6	5	3
Antilakides	8	16	13
Ermaios the Elder	34	31	27
Ermaios the Younger, (?)	10	5	13
Ermaios	1	0	0
Dicaio, (?)	6	14	13
Lion and Elephant coins	20	23	24
⁂ Symbol coins	0	0	11
Unadpherros	19	16	20
BAEIΛEVC BACIΛEWN CWTHP MEГAC	171	267	257
Analogous coins, fig. 104 to fig. 106.	1	1	0
Ditto fig. 107 to fig. 110.	8	24	20
Ditto fig. 111.	1	1	0
Ermaios of Nysa, and his family	136	179	278
Archelius	0	0	1
Diomedes	0	1	0
Ipalirisus	1	1	1
Antimachus	0	1	1
Adelphortos. (Spalyrius, J. P.)	1	0	1
Azilisus	0	1	0
Azos*	0	0	0
Indo-Scythic or Mithriac.			
Kadphises	37	Numbers not preserved.	62
Kanerkos	24		4
Kanerki family	44		67
Series 3. Obverse, figure seated in native fashion	10		19
Series 4. Couch-lounger, one foot up	56		175
Series 5. Elephant rider	56		73
Series 6. Reverse, bull and priest-okro	254		492
Series 7. Very rude—reverse, female with cornucopia	113		161
Parthian ? and Sassanian.			
As. fig. 1 to fig. 16. Small, head and fire-altar	161	Do.	278
As. fig. 44 to fig. 51. and large, of all types.			
Kufic and Brahminical	122		171

* It is a very remarkable circumstance that none of the coins of Azos, which were so numerous in the Ventura collection from the *Panjáb*, should have been met with at *Beghrám*.—Ed.

III.—*New Varieties of Bactrian Coins, engraved as Plate XXXV. from Mr.* MASSON's *drawings and other sources. By* JAMES PRINSEP, *Sec.*

Instead of pursuing Mr. MASSON's recapitulation of all the coins hitherto found by himself at *Beghrám*, we have preferred selecting those only which were new in name or type for illustration; on the present occasion confining ourselves to those bearing Greek inscriptions of the earlier class, and leaving the Mithriac, of which our author produces some highly interesting novelties, for a subsequent plate.

Fig. 1. A silver coin of ARCHELIUS, similar in character to the coins of MENANDER and APOLLODOTUS*.

Obverse. Bust of king; head bound with fillet or diadem, legend ΒΑΣΙΛΕΩΣ (δικα) ΙΟΥ ΝΙΚΗΦΟΡΟΥ ΑΡΧΕΑΙΟΥ.

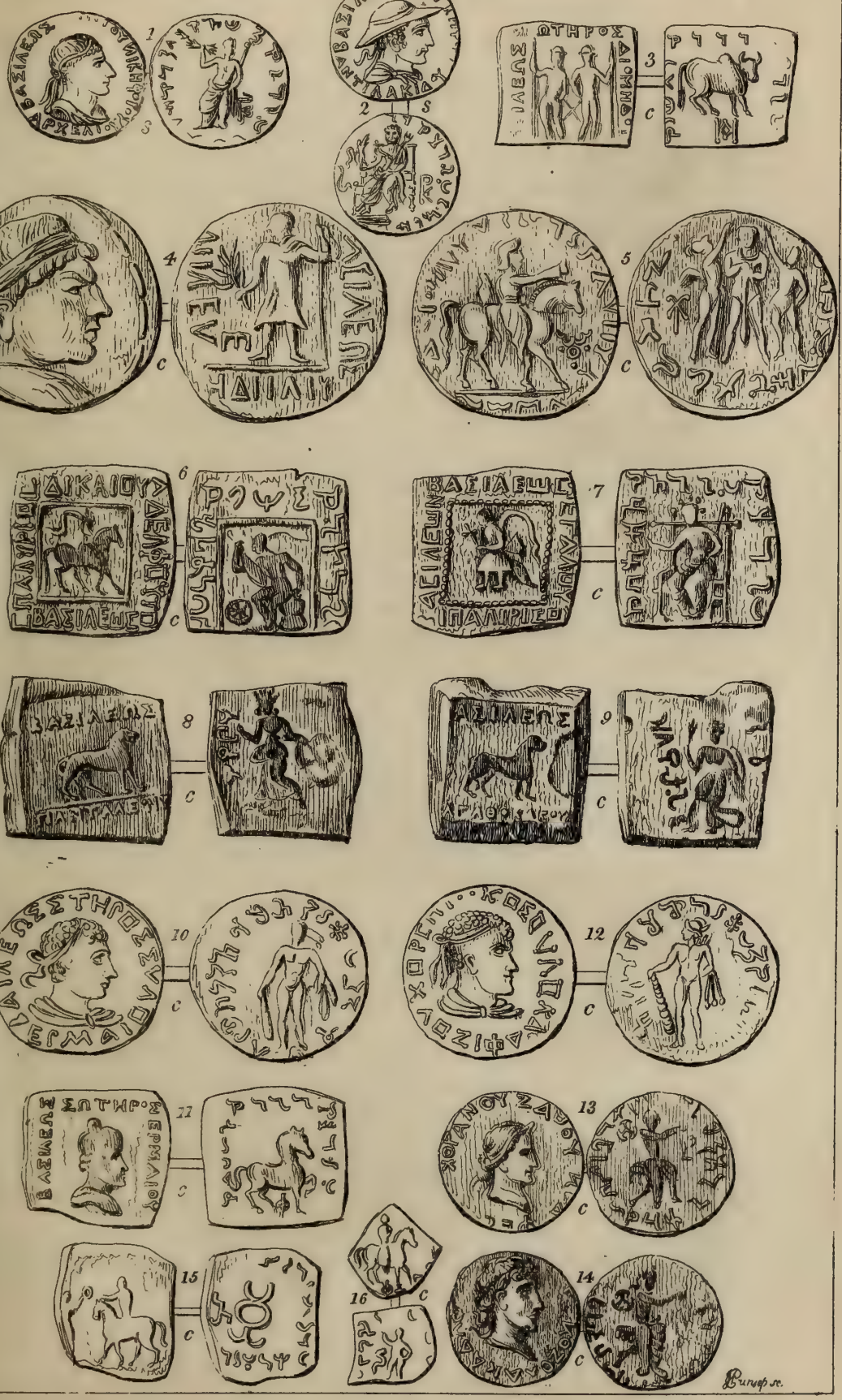
Reverse. Jupiter tonans, seated, holding sceptre in left hand. Compound monogram: the legend in the Bactro-pehlevi character is 𐨀𐨪𐨫𐨿 𐨀𐨭𐨗𐨪𐨁 𐨐𐨫𐨗𐨁 𐨠𐨪𐨫𐨁. The name is faint in the drawing, but is read with confidence by Mr. MASSON from the coin itself. It may be read *A'lakiyo* (or *jo*); but, if the second and third letters can be made 𐨁𐨪, the word will represent very tolerably the pronunciation of the Greek name *A'kaliyo*. The equivalent for *Nicephorou* is an old acquaintance, *Ajalado;* but the middle letter is altered in form. The remaining epithet 𐨐𐨫𐨗𐨁 which I have supposed to be represented in the Greek by *dikaiou*, is in fact found standing for this title "the just," in a coin of the VENTURA collection figured as No. 9, of Plate XXI. Vol. IV. A more perfect and legible specimen will be noticed below in Mr. MASSON's series (fig. 6,) in which the second syllabic letter 𐨪, *(mi)* decides the identity: but the initial is more like 𐨟, *n;* and the penultimate is 𐨿 instead of 𐨁; but as the vowel 𐨿 *(a)* according to our former observation, never occurs in the middle of a word, it should probably be read 𐨁 *(d)* and we should thus have additional evidence of 𐨁 being the same letter affected with some vowel mark.

Mr. MASSON remarks on this coin: "This silver drachma is an unique specimen found at *Beghrám* in 1835. It is evident that king ARCHELIUS must stand high in the list, but there is difficulty in locating his empire: if it be extended to *Beghrám*, why do we not meet with his copper coins?"

The same epithet, as Mr. MASSON points out, may be observed on one of the Azos group of coins having the horseman obverse (fig. 22

* Col. STACY writes, while we are correcting this proof, that he has just added another name to this group, ΒΑΣΙΛΕΩΣ ΝΙΚΑΤΟΡΟΣ ΑΜΥΝΤ.... but of this we are promised casts in a day or two: it is too late for the present plate.

Miscellaneous Bactrian Coins.



of Pl. XXIII. vol. IV.) In our coin the legend was indistinct at the top, but in his drawing it is clearly

𐭠𐭋𐭩 𐭧𐭥𐭫𐭣𐭫𐭥𐭫𐭣𐭥𐭧 𐭧𐭫𐭣𐭧 𐭧𐭫𐭥𐭧.

In this the thirteenth letter should probably be 𐭩, unless by some rule of orthography the epithet "just" is combined by a permutation of its final, and duplicated with the commencing consonant of the following word, which may be recognized without difficulty as the representative of *Megalou*, the great. We are indebted to Mr. Masson for the restoration of the inscription, which we have introduced in this place, because no other opportunity may occur of noticing this Azos coin.

Fig. 2. A silver drachma of Antilakides, discovered by Mr. Masson in 1835.

Obverse. Head of the monarch, with the peculiar hat or helmet common on coins of Eucratides, Philoxenus, Menander, &c. but rather flatter: mustachios on the upper lip (?); legend as in the copper coins of the same prince,

ΒΑΣΙΛΕΩΣ ΝΙΚΗΦΟΡΟΥ ΑΝΤΙΑΑΚΙΔΟΥ.

Reverse. Jupiter seated, holding a small victory in his right hand: in his left a sceptre or trident: monogram compounded of the Greek letters P and K: native legend 𐭫𐭣𐭧𐭩.𐭩.... 𐭧𐭥𐭫.𐭮𐭥 as on the copper coins.

Dr. Swiney possesses in the collection lately purchased by him from Keramat Ali, a duplicate of this coin, which shews the completed Pehlevi legend to agree with that given in my former notice. The device on the reverse of the square copper pieces of this prince, two beehives and palm branches, denoting, as Mr. Masson conjectures, plenty and peace, has been met with on a similar coin of Eucratides: in whose neighbourhood, therefore, it is probable the unknown Antilakides should be classed.

Fig. 3. An unique coin of Diomedes, found by Mr. Masson in 1834, and described by him in the present volume, page 24. In the memoir now before us he applies our system to the reading of the native name, which he makes out 𐭠𐭔𐭥𐭠𐭩 *ajamido*, and argues thence that the Sanscrit equivalent for Diomed may be Aja-medha, a prince of the lunar race, who reigned at *Canya-cubja*. "This remark," he writes, "is elicited from an observation in Dr. Mill's historical note on the Allahabad pillar, (July 1834,) that the Chronicles of Marwar represent Nayana Pál as having conquered *Canouje* in the year 470 A. D. from king Aji-pála, a descendant of Aja-medha. We here find a dynasty bearing the common name of *Aja* (identical with the Greek *Azos*), and suspected by Colonel Tod to have been of Scythic origin."

We may remark, however, in opposition to this ingenious conjecture, that the Sanscrit name *Aja* is but a corruption of *Ajaya*, the unconquered, and therefore might more appropriately represent the Greek *anikētos* than *Azos*, which latter I have indeed elsewhere conjectured might be found in the *Yavana-asó* of Hindu tradition*. Moreover, the first letter of the present legend may probably be 𐨤, which would give the reading 𐨤𐨁𐨪𐨤𐨫 *daya-mido*, in exact accordance, as to pronunciation, with the Greek.

Fig. 4 is taken from a drawing by M. COURT, who has been fortunate in finding a new type of this curious copper coin, the reverse of which usually presents the figure of a naked horse. (See Vol. IV. page 343.)

The present reverse exhibits the prince holding an olive branch and spear, implying peace or war, in either hand. From the collation of many specimens of the horse variety, and one small one like the above, Mr. MASSON makes out the full inscription to be ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΥΣ ΔΠΑΙΥ the Η apparent at the commencement of the lower line being the missing Σ of the word ΒΑΣΙΛΕΥΣ. This reading is confirmed by more than a dozen examples, but it still leaves us with a most unpronounceable appellation. It may possibly be only a perversion of the epithet ΔΙΚΑΙΟΥ. In MASSON's small coin the monogram ⊓ appears to be the triple blade of a trident reversed, which the figure is holding.

Fig. 5. An unique, is also extracted from M. COURT's collection. It assimilates with the numerous class of *Azos* coins, having on the *obverse* a horseman with extended arm. The inscription has much the appearance of Pehlevi, but this may proceed from the indistinctness of the Greek letters. The monogram is very peculiar and curious, from the circumstance of its constant occurrence on the degenerate gold coins of the KADPHISES group.

The *reverse* is quite in the Roman taste. Two soldiers seem to be crowning their successful chief, who rests on a kind of club. The name in the legend below is happily most distinct, 𐨤𐨪𐨟𐨤𐨪𐨤; the fourth letter is doubtful, but if read 𐨟 the combination may be hesitatingly transcribed *Yatilariko*.

Of fig. 6, three examples are known: one in the VENTURA collection was depicted in Vol. IV. Pl. XXI. It was copied hastily, and I

* In the Cashmír list of the *Rájtaranginí*, there is a prince named *Axa* (transcribed *Aj* in the Persian of the *Ayin Akberi)* whose date by WILSON is 100 B. C. but when corrected for the epoch of *Asoka*, about A. D. 180. He, too, may be one of our *Azos* family;—but if we go by resemblance of name only, we shall be liable to lay hands on the great ASOKA himself as the founder of the line!

have now reason to think I must have omitted a letter, having then engraved the name ΑΔΕΛΦΟΡΟΥ. The two new drawings, one by M. Court, the other by Masson, (both agreeing perfectly,) from which the present engraving has been taken, leave no doubt of the correct reading being ΣΠΑΛΥΡΙΟΥ ΔΙΚΑΙΟΥ ΑΔΕΛΦΟΥ ΤΟΥ ΒΑΣΙΛΕΩΣ, 'Spalyrius the just, brother of the king.' The first letter may possibly be an E, or it may be superfluous, and the name be read *Palyrius*, but the Υ on the right hand of the coin is too distinct to permit Mr. Masson's reading of the name ΑΔΕΛΦΟΡΤΟΥ, or my former reading ΒΑΣΙΛΕΩΣ ΝΙΚΑΤΟΡΟΣ ΑΔΕΛΦΟΡΟΥ. It is a very curious circumstance that the prerogative of coining should thus have been delegated to a brother, and we have unfortunately no further means of ascertaining who this indulgent sovereign may have been, further than he probably belonged to the numerous dynasty of Azos and the "great king."

On the *reverse* we have either Hercules with his club, or more probably, from the attitude, a musician playing on a kind of guitar. The Pehlevi is very distinct on three sides, and in conformity with the Greek on their parallels, the word for "king" is wanting. It would doubtless have been found in the lower compartment. The remainder, borrowing two first letters from Masson, reads 𐭯𐭥𐭫𐭧𐭭𐭩𐭯𐭱𐭪 𐭫𐭩𐭯𐭪 (𐭭𐭱). All that can be certainly extracted hence is that 𐭯𐭱𐭪, as before noticed, is equivalent to ΔΙΚΑΙΟΥ. The name is unintelligible, and the word for brother, *Ulafarmo*, approaches to no fraternal etymon with which we are acquainted, unless the first letter be 𐭣, *d*, with a vowel mark, which would express something like the Greek itself, *delpharmo!*

Fig. 7. Here again our author's labours of 1835 have enabled him to clear up one of our doubtful names (Pl. XXI. fig. 6,) and to correct his own reading of last year, (see page 25,) where he supposed it to be ΠΑΛΗΡΚΟΥ. From the native legend I had supposed the word might be read *Ulidizou*. The real name and title is now made out from six very distinct samples sent to Mr. Masson from *Munderaur* of *Lughmán*, which were in excellent preservation, having still upon them the lime cement which had been used in depositing them in some tomb. It runs thus; ΒΑϹΙΛΕΩΝ ΒΑϹΙΛΕΩϹ ΜΕΓΑΛΟΥ ΙΠΑΛΙΡΙϹΟΥ, a name which betrays a kind of patronymic affinity to the last mentioned *Spalyrius;* while in the style of coin there is also a remarkable similarity. The divinity on the *reverse* is, however, a Jupiter in his celestial chair. The native legend is easily brought to agree with the Greek, through the facile mutation of letters of acknowledged similarity; thus the 𐭮 *u*, must be a 𐭯, *p*: and the 𐭣 *di* must

be 𐨪 *ri*, and thus the context will become 𐨟𐨪𐨫𐨟 𐨟𐨪𐨟𐨪𐨟 𐨟𐨪𐨟𐨪𐨟 *malakáo malakko palirijo*, the epithet *megalou* seems to be omitted.

Figs. 8 and 9. These two coins, made known in Mr. Masson's first memoir, I have now had an opportunity of engraving from specimens in Dr. Swiney's purchased cabinet. The Pantaleon of fig. 8 is quite legible, and the curious and unknown letters of the reverse are distinct, and perfectly accordant with Masson's original drawing. The word ΑΓΑΘΟΚΛΕΟΥΣ however, is only partially visible on fig. 9, and is completed on his authority. In other respects the two coins are identical, having a dog or panther on the obverse, and a clothed female on the reverse, with a flower in the right hand. The similarity of the native character to the alphabet of the Indian láths has been before noticed, as well as the frequent occurrence of the symbols 卐 and ⁂ on coins of this group (see Pl. XXXV. of Vol. IV.)

Fig. 10 is introduced from Masson's plates as a more perfect specimen of the Hercules-reverse type than any in my former Plate (XXIV. of Vol. IV.) as regards at least the Greek legend, which is here evidently ΒΑΙΛΕΩΣ ΣΓΗΡΟΣ ΣV ЄΓΜΑΙΟV. This *Ermæus* differs from his namesake by the reverse, and by the great corruption of the Greek; but it is possible that the piece may have been contemporaneously struck at a provincial mint; and in such case, if cities may be recognized, as among the Greek coins, by their tutelary deities, we shall find a clue to the appearance of Ermæus' name on the following coin, fig. 11, which bears the reverse of the naked horse. It might perhaps be allowable to assign this horse as the armorial symbol of *Bucephalia*, while the Hercules might be attributed to some town conspicuous for his worship: victory to Nicea; and Jupiter to one of the Alexandrias (being the general reverse of the Alexandrine coins.)

The native legend on fig. 11 is the genuine Pehlevi one of Ermæus; but that on figure 10 is of the modified character so puzzling to the decypherer. It passes unaltered through a succession of princes, and may perhaps therefore embrace only their titles.

Fig. 12. It was from dubious authority that I added the name of ΚΑΔΦΙΣΗΣ to this group. Mr. Masson's Researches have now given authentic evidence that I did so justly. He has, this year, fallen upon two coins in which the name is quite distinct. It is remarkable, however, that the title of ΒΑΣΙΛΕΩΣ is here for the first time omitted, and the foreign expression ΧΟΡΑΝΟΥ introduced. This, it will be remembered, is precisely the transition that is traced in the Indo-Scythic or Mithriac series of Kanerkos; and thus we have pretty

strong grounds for inferring that the change was simultaneously effected in various provinces of the empire of the foreign, (or domestic,) usurpers who supplanted the dynasty of Bactrian descent.

There is, however, another very curious circumstance to be noted in regard to fig. 12. The Greek legend is KOΣOVAO KAΔΦIZOV XOPavov. Now, as good luck will have it, Mr. NEAVE, of the Civil Service, has just favored me with a few old coins picked up in the mofussil, among which is one in excellent preservation and well executed of the KAΔAΦEΣ.... kind described in my former paper (Vol. IV. Pl. XXIV.) The name on this coin (which I have engraved as fig. 14,) is very clearly KOZOAA KAΔAΦ.... which is just such a deviation from the orthography of MASSON's coin, KOΣOYAO KAΔΦIZOY as a provincial dialect, added to the difficulty of expressing native names in a foreign alphabet, would justify and explain. The name on two of the coins of Plate XXIV. Vol. IV. may be also read KOZOAA.

Among several coins of the same class in the collections of Capt. CUNNINGHAM and Dr. SWINEY, as well as in MASSON's plates, other variations of the spelling occur, KOΣΣYAO—KOZOVAO, &c. until at last the word becomes utterly illegible.

In a private letter from M. JACQUET, of the Paris Asiatic Society, that gentleman expresses his conviction, after seeing Dr. MARTIN HONIGBERGER's coin, that the name we have called KAΔΦIΣHΣ should be written MOKAΔΦIΣHΣ, which he supposes equivalent to the Sanscrit *Mahatrishi;* but I think we have abundant evidence against such a conclusion, since we can now produce at least three individuals of the family name of *Kadphises*. Thus—

Fig. 13, copied from a drawing in M. COURT's memoir, has the legend ZAΘOY KAΔAΦEΣ (*ou*) XOPANOY ; while on the gold coins, we have already adduced numerous instances of MO, OOHMO, or OOKMO, attached to the same. We shall take some future occasion to place all these varieties under review together ; meantime the French ships of the season will, it is hoped, enable us to profit by the disquisitions of the learned of Paris, on this highly interesting question.

Figs. 15, 16. Small coins found by Mr. MASSON in 1835, at *Beghrám*. The execution is neat and evidently Bactrian, but the names are defaced. The caduceus of fig. 15 is to be met with on the coins of MENANDER, and particularly on those of MAYOS.

It must not be supposed that Mr. MASSON's labours during the past year have been productive of no other novel results than those above mentioned. He has brought to light many new types of the Mithriac series, which I shall reserve for a future plate ; besides a very numerous series of what he has correctly designated *Indo-Sassanian*

coins, to which hitherto we have paid too little attention. To make their study useful would involve the necessity of reviewing carefully the well known Sassanian coins of Persia proper; a task, unfortunately rendered almost hopeless by the great indistinctness and perplexity of the Sassanian alphabet. I must not, however, on this account, keep back the new and curious coins with Nágari characters of which the *Beghrám* collection boasts.

In conclusion, I must once more offer the tribute of admiration for the indefatigable and successful exertions of the collector of these Bactrian relics, and express a hope that his extensive collection, now consisting of upwards of 7000 coins, may be deposited in our national museum by the East India Company, to whom it is presumed they have been annually consigned.

IV.—*Facsimiles of Ancient Inscriptions, lithographed by* Jas. Prinsep, *Secy. &c. &c.*

[Continued from page 486.]

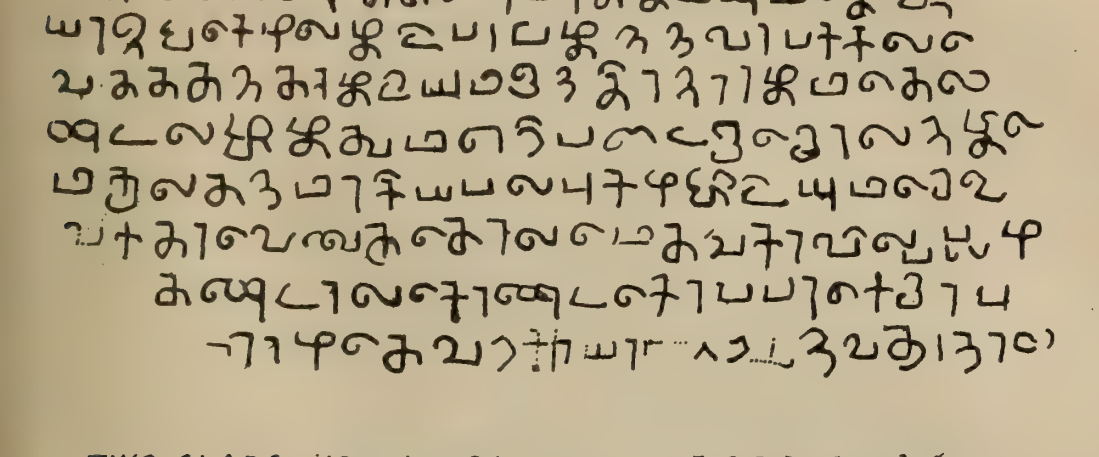
Inscriptions from Trincomalee, in Ceylon.

Dr. W. Bland, of H. M. ship *Wolf*, to whom I am indebted for copies of the three fragments forming figs. 1, 2, 3 of Plate XXVI., has favored me with the following note of their discovery and present situation:

"The three inscriptions are at present in Fort Ostenburgh, which stands on a high rocky tongue of land, forming the south side of the entrance to Trincomalee harbour; these three separate stones have been laid down to form part of the platforms for the guns of the fort. Anciently on the site of this fort stood a venerable temple of the Buddhists, which was destroyed by the Portuguese, and its remains used in the construction of a place of defence. No. 1 is $16\frac{1}{2}$ inches long and 11 inches broad, the letters $1\frac{1}{2}$ inch long, with a groove between each line two inches apart. No. 2, the same size, and its composition the same, and although found in a different bastion, has all the appearance of having at one time been united. No. 3, 14 inches long, and 12 broad, letters one inch long, all distinctly cut in the stone, but appears to have been formerly much larger. Great care has been taken to give an exact facsimile of the inscriptions. The slightly marked letters near the end were more worn, and made so in copying. As this may meet the eye of some one conversant with ancient Sanscrit or its cognate dialects, you will oblige those interested on such matters by publishing these inscriptions."

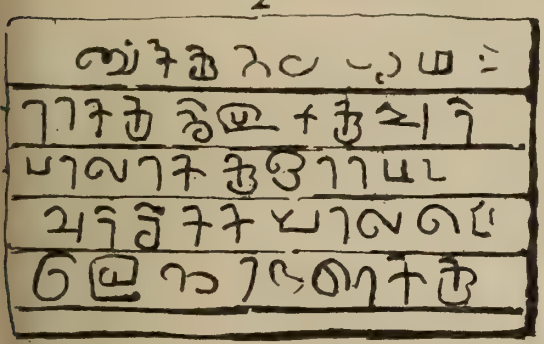
INSCRIPTIONS at Fort Ostenburgh, Ceylon.

1, on a stone slab 14 inches by 12. letters 1 in. long.

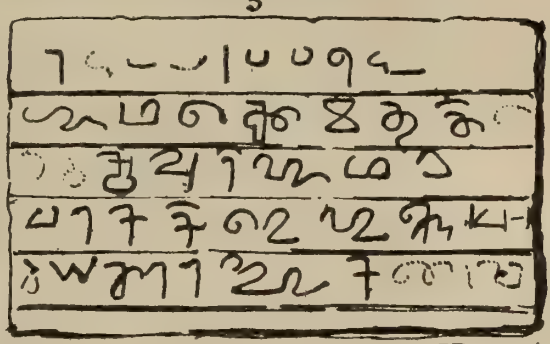


TWO SLABS of Breccia 16 by 11 inches, at Fort Ostenburgh, Ceylon.

2

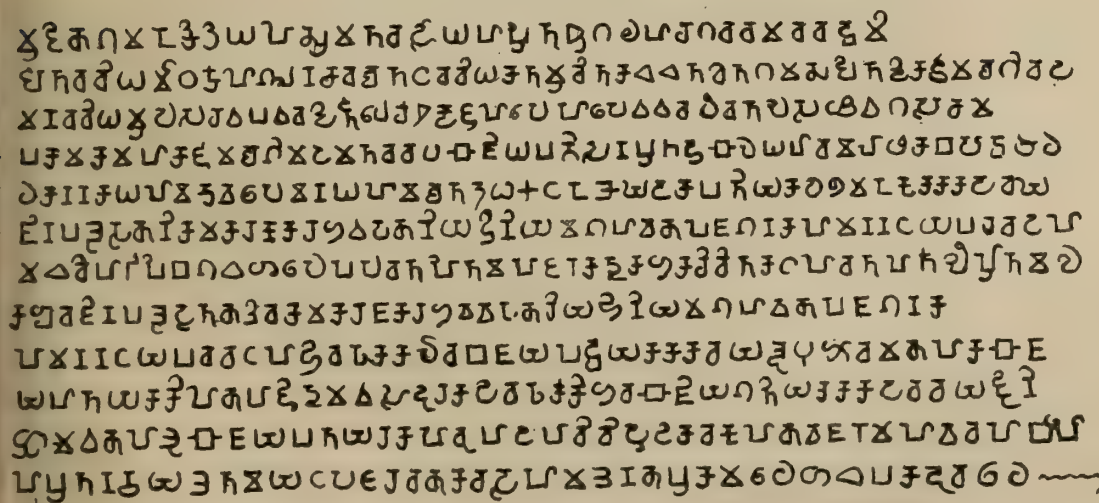


3

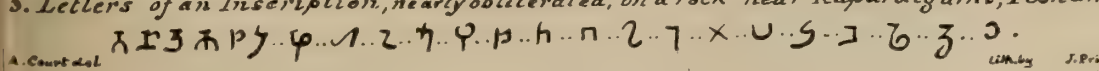


Dr. W. Bland del. J. Brinsep lith.

4. INSCRIPTION at HABURENNI



5. Letters of an Inscription, nearly obliterated, on a rock near Kapurdigarhi, Peshawer.



A. Court del. Lith by J. Prinsep

Printed at the Oriental Lith. Press, Calcutta.

The origin of the fragments of inscriptions found at Trincomalee is similarly explained in Sir A. JOHNSTON's note upon a much longer and more perfect inscription from the same place, published in the first volume of the Roy. As. Soc. Trans. page 537.

The whole of the ancient pagodas or temples of Trincomalee were destroyed as above remarked by the Portuguese in the 16th century, and their materials were used in the construction of the modern fortifications. The late Chief Justice of Ceylon adds :—

"The race of people who at present inhabit the province are completely ignorant of the character in which the inscription is written : they, however, believe from the traditions preserved among them, that it is the character which was in use throughout the whole of the northern and eastern parts of the island in the age of the two kings of *Solamandelam*, MANUMETHY CANDESOLAM, and his son KALOCATA MAHARASA, who are stated, upon what authority I cannot ascertain, in all the ancient histories of Trincomalee (of which I have in my possession both the Tamul originals and the English translations) to have reigned over the southern peninsula of India and the greater part of the island of Ceylon about the 512th year of the *Kaliyug*, or 4400 years ago*, and during his reign to have constructed not only these magnificent temples, but also the equally celebrated tanks or artificial lakes called *Kattucarré*, *Padvilcolam*, *Minerie*, and *Kandellé*, the remains of which may be considered as some of the most venerable and splendid monuments ever discovered."

There are three traditions respecting the contents of the long inscription. 1, that it contains an account of the taxes which the priests of the temples of Trincomalee had a right to levy, and of the expences incurred in the buildings : 2, that it contains an account of the construction of the great tank : and 3, that it contains the heads of the civil and criminal laws of the country.

However this may be, it is not likely that we shall very speedily be able to benefit by the preservation of this curious document, unless an actual facsimile be substituted for the manual copy published in the Transactions. It is evident from the form of many of the letters in that, and in Dr. BLAND's fragments Nos. 2 and 3, which have a strong resemblance to it in the lines drawn between each row of letters, that these are in a form of Nágari not very different from that of our early *láth* inscriptions, and there is little doubt that an accurate transcript would prove legible. Dr. BLAND's No. 1 is apparently much more

* The names above given are doubtless TIRAMADI CANDA SHOLAN and CARICALA of the Sholan dynasty of Karnáta, of BUCHANAN. According to TURNOUR, the Sholan conquest of Ceylon took place in the year 104 B. C.—ED.

modern—it is so like Tamul in many letters that I think a Madras pandit would find little difficulty in decyphering it.

Other inscriptions from Ceylon, Pl. XXVI. XXVIII.

The preceding note has called to my recollection a number of other fragments of inscriptions in nearly the same character which were sent to the Society in 1833* by His Excellency Sir R. W. Horton. They were collected from various spots in the *Matele* district by Captain Forbes, as marked on the accompanying plate: and, His Excellency says, thousands of the same nature exist on the island.

The inscription from *Haburenni* offers the best chance to the decypherer from its very perfect state :—In the 4th line I read with ease the words *paramara Mahárája....Srí mad....Vijaya Patísara puta deva.* The same word □ꬻ *vijaya* occurs very frequently in the course of the inscription. It is a name of great celebrity in the Ceylonese history, as the founder of the earliest dynasty. The opening letters of the inscription are precisely such as appear on our first Canouj coins :—they run *Mujènagama...*

I am not aware whether the inscriptions so successfully decyphered by Mr. Armour, and published in the Ceylon Almanac, include any of this class—but I presume not, as they generally refer to periods much more recent, as the reign of Sahasa Malla, in the 12th century, when we know by the coins discovered at *Dambedinia*, that the Nágari hardly differed from the present form. Moreover, they are stated to be in the Cingalese language.

Inscriptions from the Caves of Ajanta, Pl. XXVIII.

When I inserted in a former Plate (IX. see page 348) the rude facsimile of an inscription taken for me by Messrs. Ralph and Gresley, I forgot that I had in my possession several of a similar nature collected by the same parties during a visit to these caves some years ago, which were in vain shewn to the pandits of Benares and to the Secretary of the College there.

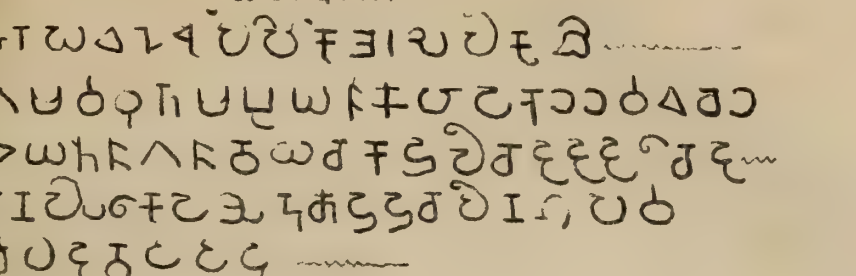
Not being aware that the measurements and drawings made by Dr. Bird for Sir John Malcolm have ever seen the light, while the brief notice and rude sketch published by Lieutenant Alexander in the second volume of the Roy. As. Soc. Trans. is any thing but satisfactory, I think it but tardy justice to put on record the materials so kindly communicated to myself.

One inscription (fig. 11) was taken with red paint on cloth from the base of a large statue of Buddha, and, curious enough, we here again trace the three initial letters "*ye dharma*" of the Buddhist formula; but

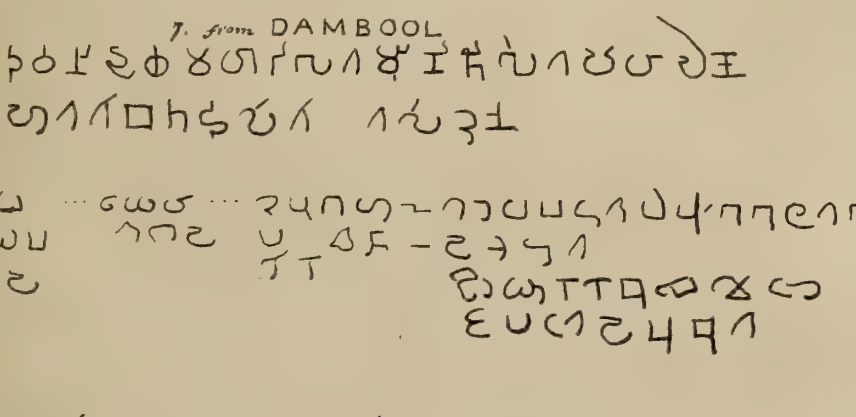
* See Proceedings As. Soc. 30th Oct. 1833.

Inscriptions from Ceylon, continued.

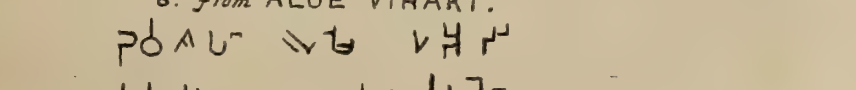
6. SIGIRI



7. *from* DAMBOOL



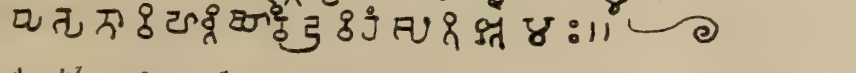
8. *from* ALUE VIHARI.



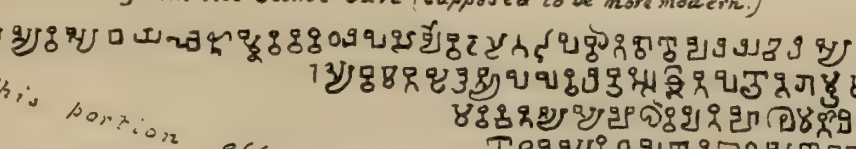
Forbes. del

S. R. A. M.

9. *Lower part of an Inscription in the Zodiac or Shield Cave at Ajunta.*

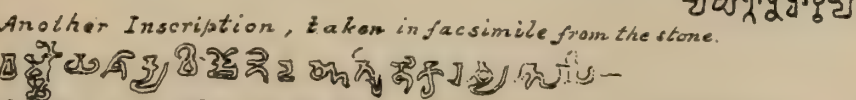


10. *Another from the same Cave (supposed to be more modern.)*



This portion effaced.

11. *Another Inscription, taken in facsimile from the stone.*



Ralph & Gresley des. J. Prinsep lith.

Printed at the Oriental Lith. Press. Calcutta.

the remainder is unintelligible, although the value of many individual letters can be readily assigned.

The fragment (fig. 10) in the parallelogram-headed character, (of which an alphabet will be furnished under a subsequent heading,) is all that remains of what was once a long inscription in the zodiac cave. It is therefore useless to transcribe it in modern character, which might easily be done for the major part of the fragment.

But it will enliven the dry recapitulation of such particulars to introduce the reader to the romantic scene whence these antique relics were derived, in the very language of Mr. RALPH'S most animated and scenic correspondence—written as he clambered up the precipitous and crumbling entrance, and threaded his way through the recesses of the hollowed hill by the light of the brahman's torch.

"On the 6th of the month I left *Aurungabad*, and went seven marches eastward that I might join Captain GRESLEY, and induce him to come hither with me. When I found him on the 13th, we were near 50 miles from this place, to which we came in two breakneck marches, galloping over stony roads and rocky torrents at the rate of ten miles an hour. We then rested one day, and on the 18th arrived here at 9 A. M. During the two last days GRESLEY has been with me, and his exclamations of admiration and regret, the mere variations of wonder,—would fill three pages. The paintings, which are fast fading and falling away, demand consideration. There is nothing in India like them. They give us glimpses of a former world—but, alas! how industriously these valuable and beautiful remains have been by violence destroyed! I shall now rapidly throw together my companion's observations, among which are all mine, in which he agreed. You know I have *no* knowledge of painting or design—only a perception of what is beautiful; but you must have remarked *his* skill in drawing and good taste in every thing.

"These caves are becoming daily more difficult of access. You pass along narrow goat paths with a chasm of 50 or 80 feet below, the footing not nine inches broad, with scarce any thing to cling to. The rains yearly making the passages worse. G. and I admired the fires on the hill above us: grass and leaves burning all night. What followed? Why, last night every hour and oftener, stones and burning rubbish, large logs half consumed, rolled down close to the tent, and this morning the ascent proved more difficult. One cave *is* inaccessible, and several are approached at the risk of life.

'What a wonderful people these must have been! Remark the head dresses. Now, is this a wig or curly hair? *All* the statues, the curved figures of BUDDHA have them. How can I say? First wigs were made to represent hair, and then hair dressed to look like wigs. 'Tis the shape of your Welsh wig, and rows of curls all over. Then the head dresses and ornaments are different from every thing we now see. These are chiefly domestic scenes—seraglio scenes;—here are females and males every where, then processions and portraits of princes which are always larger than the rest. The subjects are closely intermixed;—a medallion is twelve or fifteen inches in height; below and above, closely touching, are other subjects. I have seen nothing monstrous. No, certainly, there is nothing monstrous except where we see some figure evidently designed

for ornament, as in the compartments of the ceiling. The ceiling—aye, every thing but the floor and larger statues and small figures—every thing has been painted. It is done while the plaister is wet—it is fresco painting. I have seen the operation while going about in Rome. It has been dug off, scraped and knocked off with iron instruments. See how the stone itself has been broken!

Now, Ralph, look here: can you see this figure? No. Bring the torch nearer. Give me the torch. You can see it better now—hardly! Let us light dry grass. Bring grass now: place it here. Now watch while the light is strongest: you may now see the whole figure. This is a prince or some chief. It is a portrait. Observe how well fore-shortened that limb is—yes, I can see it now; but throw water on it—now the colours are more vivid. Here is a lovely face—a Madonna face. What eyes! She looks towards the man. Observe, these are all Hindu faces—nothing foreign. All the *sweet* countenances are of one complexion. R., now remark. Here are evidently three beauties in this apartment—one an African, one copper-coloured, one of a *European* complexion. Yes; and how frequently we see these intermixed. See this, R. is a fair man—yes, I think he is a eunuch. Another:—he has his hand round her waist, and she one hand on his shoulder. Observe; many love scenes, but little gross or grossly indecent: no nudities—nothing like the shocking sculptures on the outside of the temples in Telingana. This must be the inside of a *mahal*. Here is a woman on a *chárpáe* or some stage with legs: See, they are bathing her: do you observe the *ghara* of water in the woman's hand above? How well executed that figure is; the fore-shortening of the arms; the waist—are not her haunches too full? No. Go farther off, and you will see the figure in a better light: it is correct. This beauty has delicate drapery—nearly falling to the knee: it is transparent, like sky-coloured gauze. Observe that Abyssinian black prince seated on a bed;—remark his ornaments. Now the woman seated on his left knee whom he embraces is as fair as you or I. Did these fellows get Georgian slaves? He has two boys or pages to fan him. I wish I could make out this story—there certainly is a story. Here is a fair man of full age, dressed in a robe and a cap like some monk or abbot. Here is next to him a half naked brahman copper-coloured, with shaven crown and the single lock on his head. Here is a man presenting him with a scroll on which *something is written*. He is in a crowded court—he has come to an audience. What can all this be? This is a procession:—the elephants are passing under the windows, and women are looking out. I think they evidently express alarm. That one has her hand up, as making some exclamation.

How often we see people of three complexions in the same pannel! Now this is the most extraordinary thing we have found. Here are three placid portraits—they are *Chinese*. Nothing can be plainer:—observe the style of the hair;—the women have locks brought down in ringlets over the ears falling on to the neck, like some of the Hampton Court beauties. Observe the head dresses: there is something like a bandeau—yes, a muslin band, or the *imitation* of a turban by English women. The cap worn by the chiefs or nobles or princes is a tiara loaded with pearls mostly conical. Round the waist is a cloth, but it is not so full as a *dhoti*. A sort of *jhangia* worn by the women, coming nearly to the knees, and this drapery often transparent. Are these paintings as well done as Europeans could have executed? In the expression of the *countenances* certainly they are. The perspective is not good, and the pieces are crowded:—yet here is a *small building*, the perspective of which is *quite* correct.

Small buildings, such as are open to a garden with light pillars, are the principal domestic scenes: few or no trees. In two pieces are parties in a boat—the prow and stern both very high. Here is a hunt;—here is a horseman and dogs. I do not like the horses we see—rather poor. These are elephant-fighting;—that head is sublime.

Now, R. remark this saddle;—here is a led horse, and the saddle exactly such as we see in England with a cloth below it—nothing larger—and the bridle too. This is a war scene—here are many spears.

This zodiac, as they call it, is very elaborate. Why they call it zodiac I know not. There is in one part a bull, and in another scales. We must get a ladder to see it clearly. It might have been called the shield of Achilles as well as a zodiac. There have been eight grand compartments and sixteen smaller ones—how full of little figures! I think this is the best example in the whole series, and evidently done by the same *painters* who worked in what we call '*par excellence*' the painted caves. These medallions in the roof are very handsome. I think they resemble compartments in a Turkey carpet, or what we see in a kaleidescope—wreaths and coloured radiated patterns. Here are five women with their feet all towards the centre of the circle:—their heads alone perfect. Are they angels? There are no winged and no two-headed figures anywhere.

The zodiac is incomplete. I think about a third of it is wanting, and the lower part of the circle could never have been complete, for it must have been over this door of the cell. G. Perhaps they covered the top of the doorway with something in order to complete the circle. R. You admire it so much: you are willing to suppose it must have been complete.

What a lovely female! Yes, the last one we discover seems always the sweetest. Here is another heavenly face. This man is her lover:—a handsome fellow. You have his profile looking to the left. How eager—how full of ardent desire! The woman has just turned her face towards him, and looks with timid satisfaction and self-approving coquetry. It is excellent. But here is another beauty:—she is entreating: her head is turned towards some one above. Is she supplicating or in prayer? Shame to the villains who have destroyed these paintings!

These must have been convents, and these decorations to attract the multitude at festivals and to bring pilgrims from afar. This cave was never half finished. I can fancy that the site of a cave was granted to a society of monks with lands for their support. These, according to their ability, made it large or small, filled it with paintings when able to incur the expense.—The fewer theories you form, the fewer blunders and dreams you will make.

R. We *must* form theories—we cannot remain awake and not do so.

G. Some nation of conquerors who landed at Elephanta, coming from Egypt, first began there, and then got 2 or 300 miles to the eastward. There is nothing like these in Telingana or to the south.

R. No—only some very small caves with sculpture, rude and old,—the cave being as big as one of these ten cells. But the fewer theories you make, &c.

Now, RALPH, look at this! Why, you are half dead—no, not half dead, but knocked up. When you have 25 years added to your present age, and have completed 30 years in India, will *you* labour so well or have so much zeal? 'Tis five to one against my being alive.—But do get up and come hither. This man is going to ravish this woman;—he has a *sword*, too, in his hand. Here

are other armed men. Is it the sacking of a city? See how the water brings out the colours,—but I have given PRINSEP more than two hours. Have they brought the oil? and the ladder,—they are all here.

21*st*.—A Dr. BIRD from *Sattarah*, the Residency Surgeon, come with a design to draw up some account of the caves, dismounts from his horse at 8 A. M. Mutual greetings. In three minutes my new acquaintance praises Mr. ERSKINE of Bombay; quotes him and *swears by him*, and tells me, 'These are Jain cave temples, and, like most others in this part of India, are dug in basalt. This is amygdaloid basalt: you see it incloses masses of quartz.'

Dr. B. says he has brought a learned pandit to examine the inscriptions; that he is about to draw up an account for the London Asiatic Society, and *carry away* some of the paintings by taking from the wall. Can you draw, Sir? 'No—I am sorry I cannot.' Those who come here with that qualification are disheartened by the difficulty, or have other occupations which demand their attention, (as G.)—As for carrying away the paintings, you can do so *in powder*. I have ascertained that they will not quit the walls in laminæ, but crumble under the touch.

'I am sorry for that. I think a native painter might succeed in copying them.' Certainly he might—but you must attend on your native painter, to give him confidence. This is a wild secluded spot, within a mile or two of the frontier; barren rocks and chains of hills E. and W. The nearest inhabited place is a poor hamlet three miles off. We find marks of recent fires in the caves and caverns, and know that small parties of migratory predatory Bheels who *lift* in these parts, haunt the caves, which are very seldom visited*.

Dr. BIRD'S so-called pandit proves to be a Marhatta brahman:—can make nothing of the inscriptions—supposes them written by the Jains.

G. For my part, I think it is the character I have seen on the pillar at Allahabad, and on the column at Delhi, which no one can decypher. On the left of the portico to the zodiac cave has been an inscription four feet high and one and a half broad—the left and lower part utterly effaced by the weather. What remains, may afford a few whole words to one who has the key; (see Plate XXVIII. No. 10). Under the foot of a colossal statue, there is part of an inscription, perhaps half a name:—outside another cave. In the zodiac there is some writing—and in the same cave one figure holds out a scroll on which the writing may be legible.

MALLET'S figures in the Asiatic Researches would lead a stranger to expect statues—but the figures are entirely in *alto relievo*. Almost the only novelty is the thing I call an altar: it is nine feet high. There are four altar caves, or, as folks call them, *carpenter's*† caves. The first has the figure just mentioned at the back. In the second the altar differs in having an intermediate circle or section of a cone—another globular mass.

[* Capt. OVANS visited in March 1827; Mr. LAING saw two in July; Capt. O., Mr. G. GIBERNE and GRESLEY were here in February 1828; Mr. and Mrs. R. on the 8th of that month; G. and R. 18th and 19th of the current month; and, lastly, Dr. BIRD, an intelligent young Medical man from Bombay. Lieut. ALEXANDER of the Lancers visited them in 1824.]

† From the tradition regarding VISVAKARMA'S having constructed them in a night. See Sir WILLIAM MALLET'S description of Ellora, As. Res. VI., 389.

In the third small cave, 45 or 50 feet by 20 to 24, is a more elaborate altar *(dehgopa)*, having three globes superposed, and each stage ornamented with four pillars—on the top four figures, now much worn, supported a canopy, (evidently the ordinary Buddhist Chaitya.) But all these desultory descriptions and fragments of conversation can be of no use but to stimulate you to come hither, &c. &c."

In the same graphic style our visitor describes the kund or reservoir at the foot of cliffs 250 feet in height—and the Dehgopa or Buddha cave. Dr. Bird found no less than 25 chambers, some in an unfinished state and now covered with earth. Notwithstanding protestations about defacing monuments, this visitor contrived to peel off four painted figures from the zodiac or shield! To have copied the whole, even had he been an artist, would have taken twenty days. Of the fresco figures, in three divisions of the shield, were extant in 1828, 73 figures varying from 5 to 7 inches high. It is a great pity that none of our European tourists, whose pencils every year produce such exquisite bijoux, can be persuaded to make a visit to *Ajanta*, before the remainder of these treasures of antiquity moulder away with the damp, or fall a prey to the hand of the spoiler.

V.—*Sketch of the State of Múar, Malay Peninsula.* *By* T. J. Newbold, *Lieut., A. D. C. to Brigadier General* Wilson, *C. B.*

The information contained in this paper was obtained partly from personal observation, and partly from inquiries made while on a visit to the chief of the country at *Gressik*, on the *Múar* river, in 1835.

The state of *Múar* lies to the south of the Malacca territory, from which it is divided, towards the coast, by the *Cossang* river, and interiorly by a supposititious line drawn between *Bankon, Chondong* and Mount Ophir. The *Serting* river separates it from *Pahang,—Parrit Síput* from the tract of *Dattu Káya Padang*—and the *Murbówe Sa-ratús* from *Johóle.*

Population.—The interior of *Múar* is generally termed *Segámet.* The united population is stated not to exceed 2,400. This appears extremely scant compared with the extent of territory; and arises from the misgovernment and apathy of the feudal sovereign, the Sultan of *Johóre*—whence perpetual broils among the petty chiefs, causing insecurity of person and property, and eventually desertion of the soil by most of the cultivating and trading classes of the community. The honest peasant, in many instances, is compelled from sheer necessity to turn robber; and the coasts, instead of being crowded

with fishermen, swarm with pirates. These remarks may be applied generally to the whole of the peninsula under native sway, though to *Múar* more particularly; the whole of which country appears to be one almost uninterrupted mass of jungle and swamp, if we can except a few straggling villages and clearings. Cultivated rice grounds have degenerated into barren marshes—an enormous forest, abounding with wild elephants, overshadows a soil naturally rich and prolific; while the gaunt rhinoceros and uncouth tapir stalk unmolested over spots which, if tradition belies them not, were once the sites of large and populous towns.

Such is the melancholy picture of the effects of misrule which this unhappy country presents to the eye of the traveller, who cannot avoid being sensibly touched by this forcible, though silent, appeal for melioration.

The principal villages are *Bokko, Langkat, Gressik, Ring, Segámet, Pagoh* and *Pangkálang Kóta*, the residence of the chief, on the river,

Produce and Revenue.—The produce of the country consists of a little rice, sago, ivory, ebony, gold dust, tin, wax, aloe-wood, gum benzoin, camphor (small in quantity and of inferior quality), ratans of the kinds *Battu* and *Jagga, Dammer Battu, Dammer Miniak*, jaggery, *Lakko* wood, and *Gulígas*, stones extracted generally from the heads of porcupines, and in much repute among Malays for medicinal purposes.

The chief has been empowered by the late Sultan of *Johóre* to levy an impost upon every *bhar* of tin exported, of $1\frac{1}{2}$ Spanish dollars.

One hundred bundles of ratans,	1	do.	do.
One bhar of ebony,	$1\frac{1}{2}$	do.	do.
One koyan rice imported,	2	do.	do.
One koyan salt ditto,	1	do.	do.
One katti of opium ditto,	20	do.	do.

On smaller articles he levies a duty of 5 per cent. He has the power of exacting the gratuitous labour of his subjects, and derives some emolument from the fines he inflicts on them at pleasure.

Government.—*Múar* is under the sway of a chief bearing the title of *Tumúngong*, who is a vassal of *Johóre*. Under the *Tamúngong* are eight *Panghúlás*, four of whom are styled *Ampat de Ilir*—the remainder, *Ampat de Ulu*. The former are the *Panghúlús* of *Gressik, Bukit, Ráya, Liang Battu*, and *Ring*;—the latter, those entitled *Besar, Tanjong, Daggang*, and *Muncal*. There is nominally a mosque under each *Panghúlú*, but in that of *Umbum* alone is the *Juma-ahad* held. This is in the jurisdiction of the *Panghúlú besar*. The customs enjoined by the code termed *Undang Undang Maláyu;* and the Mahommedan law

of succession obtains, to the exclusion of the *Trómba Pusáka* prevailing in the four *Menangkábówe* states.

History.—Múar, like the rest of the Malay peninsula, was formerly inhabited by savage aboriginal tribes, among whom the *Jacoons* seem to claim the superiority. With regard to its origin, it is stated in the *Sejára Maláyu* that *Srí Iscander Shah*, the monarch of *Singhapúra*, on his city being taken by the *Bitára* of *Majapahit*, fled to *Múar*. This event took place about the middle of the 13th century; and it is asserted that he left one of his *Mantris* in the interior of *Múar*.

No more mention is made of this state until near the middle of the 14th century, when the kingdom of the Sultan of *Malacca*, Mozaffer Shah, was invaded by the Siamese under T'hawi Chacri. The Sultan on this occasion directed a levy of the population of *Múar* to be made, and the inhabitants to be assembled at *Malacca*. According to the Malay annals, the war between *Siam* and *Malacca* "continued for a long time, and great numbers of the Siamese perished; but *Malacca* was not reduced. At last the whole Siamese army retreated, and as they took their departure they threw down large quantities of their baggage ratans in the district of *Múar*, where they all took root; and that is the origin of the name *Rotan Siam*. Their stocks, which were formed of fig-tree wood, likewise took root in a place in the vicinity of *Múar*, where it still exists. The rests for the Siamese cooking places also took root and grew up, and are to be seen at this day at the place named *Tumang Siam*." I was unable to find out the locality of the places here mentioned by the author of the *Sejára Maláyu*, though every inquiry was made near the spots where these scenes are said to have occurred. The tradition, however, of the defeat of the Siamese was universally current. In 1511, Ahmed, Sultan of *Malacca*, on his city being taken by the Portuguese, retreated up the *Múar* river to a place called *Pagoh*, about 15 or 16 miles from *Gressik*, now under the *Panghúlú besar*, Inchi Muit. Sultan Mahmu'd remained at *Battu Hampar*, and founded a fort at *Bentayen*. According to the *Sejára Maláyu*, the Portuguese pursued Ahmed up the river, attacked and took *Pagoh*. Ahmed fled further up to *Panarígan*, near *Jompóle*, and thence, accompanied by Mahmud, repaired to *Pahang*. The latter subsequently established himself at *Johóre*. Many of their adherents remained in *Múar* and *Segámet*, and in course of time erected a primitive form of government, directed by four elders, styled *Tuah Campongs*, who ruled under the Sultans of *Johóre* until 1119 A. H. The four *campongs* were those of *Pagoh*, *Sungie Ring*, *Sungie Terap*, and *Gressik*.

A. H. 1119. A *Mantri* of high birth in *Johóre*, named Samade Rája, obtained a grant of the territory of *Múar* from the then Sultan

of *Johore*, ABDAL JALIL SHAH III. He settled at a place called *Pantei Layang* on the banks of the river, and ruled till 1145 A. H., when he died succeeded by his son PADU'KA TUAN; who, on his proceeding to the court of *Johóre*, on the occasion of his father's demise, was invested by the Sultan ABDAL JALIL with the title of *Tumúngong Padúka Tuan*. He died A. H. 1175, succeeded by his son BUROK or AHOK, who was confirmed by Sultan ABDAL JALIL SHAH IV., then resident at *Rhio*, whither he had removed from *Johóre*. BUROK died at *Búnga Tanjong* on the *Múar* river in 1214 A. H. leaving two sons, KONIK and IBRAHIM. The former went to *Lingga* to present himself to Sultan MAHMU'D III. by whom he was acknowledged as third *Tumúngong* of *Múar*.

KONIK died in 1246, A. H. leaving a son named SYED, the present chief, who succeeded him: he also left a daughter. SYED proceeded to *Singapore*, where he was confirmed by the late Sultan, HUSSAIN SHAH I., whom the English had recently placed on the throne of his ancestors. From him he obtained the title *Tumúngong Dattu Syed*.

It would appear from what has been advanced above, and by the subsequent Boundary treaties, that *Múar* has always been feudal to the Sultan of *Johóre* since the time of their ancestors, the ancient sovereigns of *Singapore* and *Malacca*. The Dutch, however, when in possession of *Malacca*, appear to have claimed *Múar*, as in the map of VALENTYN the boundary line of the Dutch territory is made to extend so far beyond the *Múar* river as the *Rio Formoso*.

The *Tumúngong's* sway is confined to the villages immediately on the banks of the *Múar* river and on those of the stream of *Segámet*, which empties itself into the *Múar* about 12 miles above *Pankálang Kóta*. He appears to be popular from his easy temper, and the inhabitants feel alarmed at the idea of any change being made in the government by the Sultan of *Johóre*. We had an interview with this Malay chief at a village, about 18 miles up the river, called *Gressik*. He acknowledges himself a vassal of *Johóre*, and sends annually to the Sultan the amount of a duty levied on the houses of the settlers at *Padang* (one dollar per house) and 200 *gumpits* of rice.

Malayan Albino.—On landing at *Gressik* I was struck by the singular appearance of a Malay lad, an *Albino*, standing under the shade of a tree on the river bank. His skin was of a reddish white, with blotches here and there, and thinly covered with short white hairs. The eyes were small and contracted; the iris of a very light vascular blue; the lids red, and fringed with short white lashes; the eyebrows scant and of the same colour; the pupil much contracted from the light. On calling him to come near he appeared to be ashamed.

He evinced an extreme sensibility to the stimulus of light, from which he almost constantly kept his eyes guarded by shading them with his hands. He told me he could see better than his neighbours in imperfect darkness, and best by moonlight, like the "moon-eyed" *Albinos* of the Isthmus of *Darien*.

He is morbidly sensitive to heat: for this reason and on account of the superstitious respect with which the Malays regard him, he is seldom employed by his friends in outdoor labour, although by no means deficient in physical strength. The credulous Malays imagine that the Genii have some furtive share in the production of such curiosities, though this they tell as a great secret. To this day the tomb of his grandfather, who was also an *Albino*, is held sacred by the natives, and vows *(niyats)* made at it. Both his parents were of the usual colour. His sister is an *Albino* like himself.

Albinos, I believe, are not common on the peninsula, nor are there any tribes of them as, according to Voltaire, exist in the midst of Africa. In the only two instances I recollect observing, the eyes were, in both, of a very light blue; the cuticle roughish and of a rosy blush, very different from that of the two African *Albinos* seen and described by Voltaire, and quoted by Lawrence; "Leur blancheur n'est pas la nôtre; rien d'incarnat, nul mêlange de blanc et de brun, c'est une couleur de linge, ou plutôt de cire blanchie; leurs cheveux, leurs sourcils sont de la plus belle et de la plus douce soie; leurs yeux ne resemblent en rien à ceux des autres hommes, mais ils approchent beaucoup des yeux de perdrix." *Essai sur les Mœurs.*

Whitelaw Ainslie, in his description of the *Albinos* of continental India, ascribes to them the same delicacy of constitution and shyness observable in the Malayan *Albino*, and that they are seldom known to live to an advanced age. The females, he remarks, rarely bear children; but when they do, their offspring is of the natural colour of the cast to which they belong.

Observations on the Múar river.—The *Múar* river at the mouth has an apparent width of about 600 yards, and at *Gressik* 18 miles up the stream is about 100 yards broad and 7 fathoms deep. The soundings at the bar varied from $\frac{3}{4}$ to 4 fathoms low water. The current ran at the rate of $2\frac{1}{2}$ miles an hour. It has its rise, according to the natives, among the mountains of *Jellaboo*, and falls into the sea about 30 miles south-east of *Malacca*. From these mountains the *Serting* river, which disembogues itself into the China sea at *Pahang*, and the *Calang* river, which flows into the Straits of *Malacca* near *Salangore*, have also their rise. The general direction of the *Múar* river from the

mouth to *Gressik* we found to be N.E.—its course tortuous, the banks for the most part low, muddy, and covered, with the exception of the vicinity of villages and a few *Ladang* clearings, with dense jungle. Among the trees near the river's margin we observed the mangrove, the *Nipah* palm, (the *Nypa fruticans* of THUNBERG,) the *Nibong*, (the *Areca Tigillaria* of Dr. JACK,) the *Api-Api*, (*Pyrrhanthus Littoreus,*) the *Pedáda*, the *Neridi*, and the *Búta-Búta*.

The water of the river was more turbid than that of the *Lingie*, which might be owing to the freshes from the hills. The paucity of cultivation, thinness of population, and the almost total absence of trading boats and even fishing canoes on the river, could not fail to strike the most careless observer. By this river there is a communication, almost all the way by water, with the eastern coast of the peninsula, frequently adopted by the *Pahang* traders. The navigation was formerly under the control of a *Bugis* chief named UNKU' KLA'NA, who settled at the mouth of the river; and, after him, under his son *Rája* ISSA: but on the return of the latter to *Rhio* in 1826, it reverted to the *Tumúngong*.

In former days the mouth of the river was a noted place of rendezvous for the fleets of the Siamese, and in later times of the Malay princes, in their attacks on *Malacca* during the Portuguese and Dutch administrations. The last instance occurred in 1784, when *Rája* HADJI, the *Múda* of *Rhio*, anchored there with a fleet of 170 prows on his way to invade *Malacca;* an enterprize in which he lost his life.

Gold Mines of Bukit Ráya.—Gold dust is found a short distance from the left bank of the river at *Bukit Ráya*, a low hill covered with forest, which was pointed out to us by the guides. There were, we were told, formerly gold mines on and at the foot of this hill worked by Malays, who were compelled to quit them through the exactions of the petty chiefs. The *Tumúngong* had brought down with him in his own boat to *Gressik*, two Chinese miners, with the view of ascertaining whether any mining speculations there would be likely to turn out profitably or otherwise. I have not heard the result. Tin is also found near *Bukit Ráya*.

From *Gressik* we saw a range of hills at a great distance running down the peninsula in a south-easterly direction, one of the highest of which is called *Siang-battu*, the Cave of the Rock. From this mountain, the natives affirm, flow the rivers of *Battu Pahat*, (the *Rio Formoso* of the Portuguese,) *Pontian, Undówe, Roompin, Bennoon*, and *Johóre;* the last of which streams empties itself into the sea at the extremity of the peninsula: on its left bank stood the capital of the

Statue of SILENUS discovered by Col. Stacy.



FRONT VIEW



J.P. del. et lith.

BACK VIEW

Malay empire of *Johóre*. This range of mountains seems to be a continuation, if I may so term it, of the broken chain running down the peninsula through the States of *Quédah, Perak, Salangore, Súngie-ujong, Rumbówe, Jellaboo,* and *Srimenanti,* terminating near Point *Romania,* and probably having their origin in the lofty ranges which overlook the vast *steppes* of Northern Asia.

VI.—*Note on the discovery of a relic of Grecian Sculpture in Upper India. By Lieut.-Col.* L. R. Stacy. *Plate XXXI.*

[In a letter to the Editor, dated Alígarh, 29th February, 1836.]

I have the pleasure to enclose two sketches exhibiting the obverse and reverse of what appears to me a Grecian perirranterion (περιῤῥαντηριον (1) in stone (Italian, tazza*). The block, which is three feet in width, three feet ten inches high, and one foot four inches thick at the base, is of the hard red sandstone with white spots, which is found so plentifully in the *Agra* district, particularly in the neighbourhood of *Fattehpúr Sikrí,* and of which the greater number of the ancient buildings at *Agra* are constructed.

This relic was given to me by a friend at *Mathura:* it is in a very mutilated state, but fortunately sufficient development of it remains to determine, I think, its original character and use.

The obverse represents Silenus inebriated; he is reclining on a low seat or throne, supported on either side by a young male and female Grecian. Two minor figures support the knees: the attitude of Silenus, the drooping of the head, the lips, and powerless state of the limbs, give an extremely accurate representation of a drunken man. The figures of the youth and maiden are also in appropriate keeping. The whole is evidently the work of an able artist, who could not possibly, in my opinion, have been a native of Hindustan.

The reverse appears to have been executed by a less skilful person, and the figures carry an Indian style about them. The back-ground represents a grove, and the trees are loaded with fruit. Four figures are conspicuous in front: on the left hand a Grecian girl, with short tunic and loose drapery falling to the ground; her sandals are ornamented; her right hand is grasped by the right hand of the figure next to her, a young man, whose apparel is confined to a *jhangí:* he has a kerchief round the neck with a tie in front as worn by sailors. Next to this is another female in a Grecian dress: she would seem to right, who is in the act of putting on woman's attire. The bracelets

(1) Vide Potter's Grecian Antiquities, vol. i. pp. 224 and 262.

*. Vide Moses' Antique Vases, Pl. 95.

be highly amused with the person (a young man) immediately on her of this female reach half way to the elbow, and are most elaborately and beautifully executed, but the appearance of this figure is less elegant than that on the extreme left. At the feet of the group are goblets. The heads of the figures are bound with vine leaves.

The figures on the obverse are on a larger scale than those on the reverse: the deficiency on the reverse is supplied by trees, forming a grove. The whole supports a circular bason or font measuring sixteen inches in diameter, and which must have been originally about eight inches in depth. As already noticed, this relic is sadly mutilated, and it is probable the bigotry of Muhammadans, (who perhaps considered the work connected with Hindu idolatry,) occasioned the injury done to the faces and breasts of all the figures and a great part of the bowl. Enough, however, remains to identify it as representing a scene in the Bacchanalian festivals.

For the present I will simply add, that should this piece of sculpture prove to be what I conjecture it to be, the correctness of WILTON and JONES' (2) opinions will be strongly evidenced, when they asserted a similarity of the gods of the Greeks and Indians, and that this led to intermarriages, and thus the former merged into and were ultimately lost sight of in the Indian community. (3)

NOTE.—The discovery of a piece of sculpture bearing evident reference to Greek mythology, if not boasting as unequivocally of the beauty and perfection of Grecian sculpture, might excite less surprize after the elaborate display we have lately had of coins found in Upper India and in the Panjáb with Grecian legends, and a combination of Hindu and Greek deities. Yet, in fact, the latter offer no explanation to the former—on the contrary, they relate exclusively to a period comparatively modern, when the worship of *Mithra* spread through the world with the rapidity of the element of which he was the type, and superseded in a great measure the more ancient superstitions; whereas the worship of Bacchus—or of SILENUS, his wine-inspired counsellor, must belong to a much more remote period—nor can we trace any clue to it in the present mythology of the Hindus. True there have been traditions preserved in the West, of BACCHUS' expedition to India, and of the easy conquest every where following the steps of the hero who could make rivers run with wine—and fought with an army of laughing Bacchantes and satyrs.

(2) Vol. i. p. 221, Asiatic Researches.

(3) This opinion of WILTON'S is quoted in CONDER'S History of India. I cannot immediately say in which vol. of the As. Researches it is to be found.

The Dionysiacs of Nonnus have been quoted by Colonel WILFORD, and analysed by Professor WILSON in our Researches—but without hinting at their hero having been grafted on the pantheistic system of India. *Nishapur, Déva-Nahushanagar,* and other towns, have been pointed out as the site of *Nysa, Nicea,* or *Dionysiopolis,* where the extravagant rites of DIONYSOS' worship were celebrated with the greatest pomp:—where, according to some authorities, he was born—where, according to others, he founded a city in honor of a damsel, NICÆA, whom he encountered in his expedition through *Persia* and *Bactria*:—but all is vague and uncertain on the subject. The Indian origin indeed of the religion of BACCHUS, long ago asserted and believed, has lately come to be suspected from the want of any arguments in its favor but a few slight resemblances of names and ceremonies. Professor A. W. SCHLEGEL expressly denies in his Indian Library, that the Greeks had, previous to the conquests of ALEXANDER, any idea of an expedition of BACCHUS to or from India*. The author on whose authority this opinion is repeated, Mr. T. KEIGHTLEY, thus traces the origin of the confusion:—

"When ALEXANDER and his army had penetrated to the modern *Cábul,* they found ivy and wild vines on the side of Mount Merus and on the banks of the Hydaspes: they also met processions, accompanied by the sound of drums and parti-colored dresses, like those worn in the Bacchic orgies of Greece and Lesser Asia. The flatterers of the conqueror took thence occasion to fable that DIONYSIUS had, like HERCULES and their own great king, marched as a conqueror throughout the east: had planted there the ivy and the vine, had built the city of *Nysa,* and named the fountain *Merus* from the circumstance of his birth from the thigh of ZEUS. At length, during the time of the Græco-Bactric kingdom, some Greek writers, on whom it is probable the Brahmans imposed, as they have since done on the English†, gave out that DIONYSUS was a native Indian, who having taught the art of wine-making in that country, made a conquering expedition through the world to instruct mankind in the culture of the vine and other useful arts. And thus the culture of the vine came to Greece from a land which does not produce that plant! This last is the absurd hypothesis which we have seen renewed in our own days, and supported by all the efforts of ingenious etymology!"

Colonel STACY's group may throw a new light on this curious question. There can be no doubt as to the personage represented by the principal figure—his portly carcass, drunken lassitude, and

* KEIGHTLEY's Mythology of Greece, 170. † Alluding to Col. WILFORD.

wine-wreathed forehead, stamp the individual: while the drapery of his attendants pronounces them at least to be foreign to India, whatever may be thought of Silenus' own costume, which is certainly highly orthodox and Brahmanical. If the sculptor were a Greek, his taste had been somewhat tainted by the Indian beau ideal of female beauty —in other respects his proportions and attitudes are good—nay, superior to any specimen of pure Hindu sculpture we possess: and considering the object of the group—to support a sacrificial vase (probably of the juice of the grape)—it is excellent. It would be time well bestowed to survey all the temples and antiquities of *Mathura*, in search for other specimens of Grecian art. Colonel Stacy can have no greater inducement to undertake this pleasing task, than the possession of the highly interesting relic which we have made a faint attempt to introduce to the eye of our readers in the accompanying lithograph.—Ed.

VII.—*Description of some Grasses which form part of the Vegetation in the Jheels of the district of Sylhet. By* William Griffiths, *Esq. Assistant Surgeon, Madras Establishment.*

Zizania ? ciliata. *Spreng Syst.* ii. *p.* 136; *Kunth Agr.p.*10.

Leersia ciliata. *Roxb. Fl. Ind.* p. 207.

Pharus ciliatus. *Retz. Obs.* 5. p. 23.

Gramen in aquosis proveniens, culmis gracilibus basi longe repentibus, articulis cylindraceis pubescentibus, cæterum lævibus.

Folia subglaucescentia, linearia, acuta, supra lineata et tactu scabra, margine subsimplici scabro.

Spicæ paucæ, distantes, subsecundæ, in paniculam nutantem alternatim dispositæ.

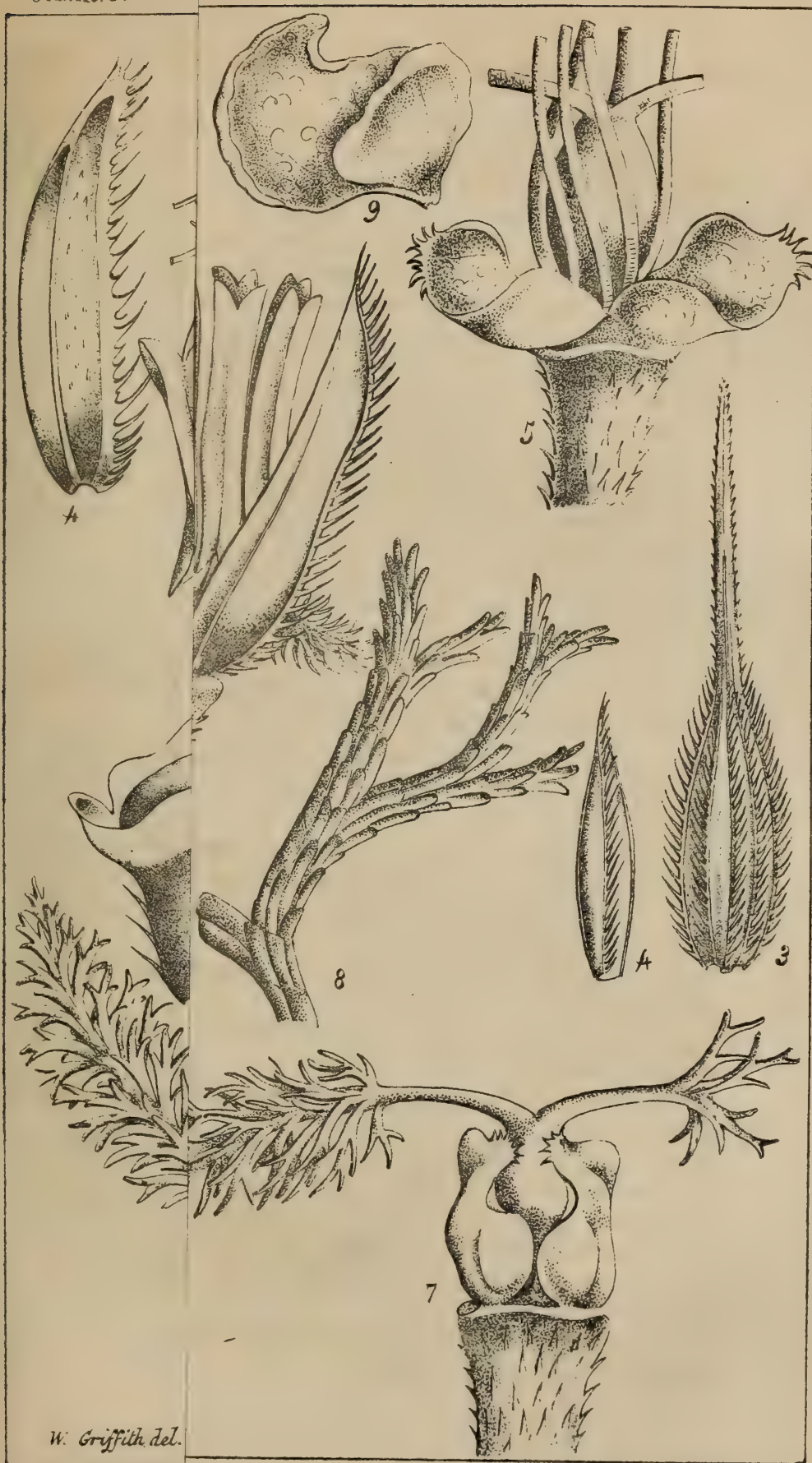
Spiculæ solitariæ, in apice cyathiformi pedicelli curvati articulatæ, subsessiles, unifloræ.

Glumæ nullæ, nisi cupulam membranaceam apicis pedicelli glumam existimes.

Paleæ 2, chartaceo-coriaceæ, compresso-carinatæ, muticæ, obtuse mucronatæ, brevissime stipitatæ, stipite crasso rotundato; exterior 5-venia, venâ mediâ (carinâ) duabusque marginalibus denticulato-ciliatis, duabus intermediis subglabris, interveniis scabris; interior 3-venia, paullo brevior, carinâ denticulato-ciliatâ, intervenio scabro, cæterum læviuscula.

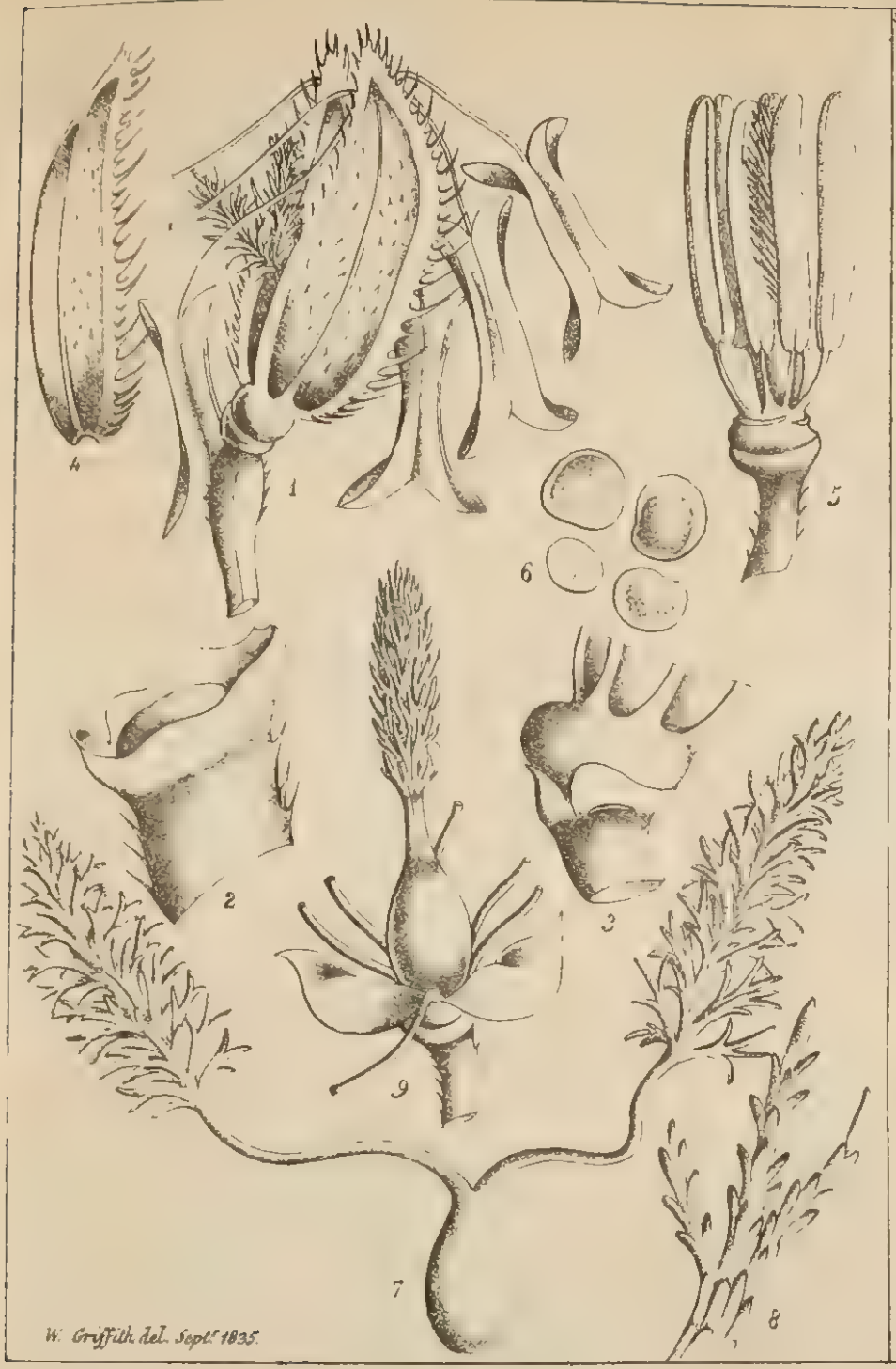
Lodiculæ 2 carnosæ, acinaciformes, integræ, glabræ.

Stamina 6, antheris longe exsertis.



J.B. Tassin's Lith.c Press. Calcutta.

tamochloa Retzii.



Zizania ? ciliata.



Potamochloa Retzii.

Ovarium ovato-oblongum, glabrum. Styli 2. Stigmata plumosa, divisionibus ramosis, ratione stylorum longa.

Caryopsis

Legimus in aquosis *Jumalpore*, in plagis inundatis, *Jheels* vernacule dictis, *Sylhet* confinibus; in collibus *Khasiensibus* prope *Nunklow*; et nuperius in regione *Assamica* alta; annis 1835-36.

With regard to this grass, we have Mr. Brown's authority (Prodr. Fl. Nov. Holl. ed. Nees 1. p. 67, sub *Leptaspide)* for its being totally distinct from *Pharus*, to which it was originally referred by Retzius. Mr. Brown likewise points out (loc. cit.) that this and the succeeding, if not retainable in *Zizania*, will constitute a distinct genus. It will be seen that I have ventured to go farther, and I am only deterred from characterizing this as itself distinct, by the difficulty I find in distinguishing it from *Leersia*, with which genus I am only acquainted through M. Kunth's Agrostographia. Its obvious affinity is with *Oryza*, from the awnless varieties of which it only differs in the total absence of glumes; the presence of the membranous cup terminating the pedicel in *Oryza* proving, that it is not to be considered as a modification of these envelopes.

Potamochloa. *Griff.*

Syst. Linn. *Hexandria Digynia.* Order, Nat. *Gramineæ*, Juss.

Spiculæ unifloræ. Glumæ nullæ. Paleæ 2 membranaceo-chartaceæ, carinatæ, apertæ, exteriore in aristam productâ. Lodiculæ 2. Stamina 6. Styli 2. Stigmata plumosa.

Caryopsis.

Gramen fluitans ope vaginarum cellulosarum, dense cæspitosum. Folia lata; ligula obsoleta. Panicula effusa erecta; pedicelli infra medium constricti.

Potamochloa Retzii. *Griff.*

Zizania? aristata. *Kunth, Agr.* p. 10.

Leersia aristata. *Roxb. Flor. Ind.* 2. p. 207.

Pharus aristatus. *Retz. Obs.* 5, 23, *ex Kunth.*

Hab. In aquis stagnantibus prope *Jumalpore*, et copiosissime in inundatis, *Jheels* dictis, *Sylhet* confinibus. Legimus florentem Septembre, 1835.

Culmi emersi vix pedales, glabri. Immersi longissimi, hinc illinc radiculas capillaceo-divisas emittentes.

Vaginæ immersæ vel semi-immersæ quam maxime cellulosæ, incrassatæ et quasi inflatæ; emersæ longiores cylindraceæ, minus cellulosæ.

Folia in exemplaribus spontaneis semper emersa et erecta*, lanceolata, basi cordata, obtusa, apice sub-cucullata, rigida, suprà tactu scabra.

Panicula erecta, axi ad ejus originem subito angustatâ; rami infimi subverticillati, divaricati, superiores alternantes, ascendentes.

Spiculæ ramis adpressæ, subsecundæ, inferiores geminatæ, inæqualiter pedicellatæ, superiores solitariæ longius pedicellatæ.

Pedicelli clavati, infra medium constricti, ibidemque annulo rubro insigniti, spicularum infimarum curvati.

Paleæ sessiles, apicum pedicellorum continuæ! vix compressæ; *exterior* major 5-venia, venis denticulato-ciliatis, cæterum parce hirta; arista continua, recta, scabra, paleam excedens; *interior* mutica, acuminata, 3-venia, carinâ denticulato-scabrâ, venis lateralibus lævibus, pallidis.

Lodiculæ 2, subacinaciformes, magnæ, extrorsum gibbosæ et carnosæ, introrsum sub-membranaceæ, glabræ vel apice ciliatæ.

Stamina 6. Filamenta longe exserta. Antheræ lineares, longæ.

Ovarium oblongum, glabrum.

Stigmata ratione stylorum longiuscula.

Caryopsis non visa; stipitata?

It is this genus that appears to me allied to *Zizania*. It differs, I conceive, materially from the preceding in habit, in the shape and consistence of the paleæ, which are open during the period of inflorescence, and in the outer one being awned.

Vossia. *Wall. et Griff. Mss.*

Syst. Linn. *Triandria Digynia.*

Ordo. Nat. *Gramineæ, Jussieu.*

Char. Gen.—Spica compressa, articulata, rachi flexuosâ excavatâ. Spiculæ in singulo articulo duæ, alterâ sessili, alterâ pedicellatâ, biforæ. Glumæ 2 dissimiles, exterior chartaceo-cartilaginea, plana, apice in cuspidem producta; interior chartacea, mutica, carinato-navicularis. Flosculi hyalini, mutici; superior (interior) hermaphroditus (in spicula pedicellata sæpius masculus), bivalvis 3-venius. Lodiculæ 2, cuneatæ, dentatæ. Stamina 3. Styli 2. Stigmata plumosa. Caryopsis.. Flosculus inferior masculus, bivalvis, bivenius!

Gramen procerum, fluitans, cæspitosum.

Culmi 3—4-stachyi. Folia longissima, acuminatissima, plana, venâ centrali crassâ albâ. Ligula indivisa, dense ciliata. Diximus in memoriam b. Johannis Georgii Vossii, poetæ Germanorum dulcissimi, eru-

* In exemplaribus in horto botanico Calcuttæ cultis natantia, oblongiora et teneriora.



W. Griffith analysin del.

Vossia procera.

Luchmun Sing gramen del

J. B. Tassin's Lith.o Press— Calcutta

Tab. V. Pl. XXIII



W. Griffith analysin del.

Vossia procera.

Ludmun Roy gramen del

J. B. Thacker's Lith.ª Press — Calcutta

PL. XXIII

ditissimi, poematum græcorum et latinorum, imprimis Georgici Virgiliani translatoris et commentatoris locupletissimi, rerum botanicarum et agrestium insigniter periti.

VOSSIA PROCERA. *Wall. et Griff. Mss.*

ISCHÆMUM CUSPIDATUM, *Roxb. Flor. Ind. ed. Carey*, 1. p. 325. *Kunth*, Agr. 1. p. 516.

Hab. In inundatis vernacule *Jheels* dictis prope Hubbeganje, fluminis *Barak*, Bengalæ orientalis. Florentem invenimus mense Septembris, 1835.

Gramen glaucescens, in aquis stagnantibus leniter fluentibus profundis nascens. Culmi immersi longissimi, crassi, cellulosi, radiculas capillaceas ad geniculas emittentes, emersi 3—4-pedales, vaginis laxis, compressiusculis, tactu scabris undique tecti. Vaginarum axillæ gemmiferæ ; colla dense barbata. Ligula brevis truncata.

Folia lineari, ensiformia, basi subcordata, longissime subulato-acuminata, 2, $2\frac{1}{2}$ pedalia, supra parce pubescentia, infra glabra, venâ centrali crassâ, albâ, supra planâ, subtus prominulâ, marginibus cartilagineis antrorsum denticulatis.

Spicæ terminales, binæ vel ternæ, rarius quaternæ, digitatæ, 6—8-unciales, patentes, subnutantes, laterales subsessiles, rudimento alterius interdum adjecto, terminalis pedunculata, insertionibus cartilagineis plus minus hispidis. Rachis introrsum planiuscula, extrorsum convexa ; flexuris dextrorsis sinistrorsisque, marginibus scabris. Spiculæ pedicellatæ, infimæ summæque tabescentes. Pedicelli spicularum inferiorum articulis paullo longiores. Gluma exterior dorso plana, venoso-striata, apice producta in cuspidem ensiformem, longam, glumam ipsam fere bis superantem, rectam, vel subundalatam, venoso-striatam, marginibus denticulato-scabris.

Interior navicularis, carinâ obliquâ a medio suprâ scabra, breviter mucronata, irregulariter venosa, venâ centrali nunc incompletâ, intermediis incompletis et sæpius, præsertim spiculæ sessilis, cum vena centrali arcuatim confluentibus.

Paleæ flosculi exterioris masculi membranaceæ, complanatæ, biveniæ ! exterior apiculo brevi pubescente : marginibus mutuo involutis subciliatis.

Lodiculæ 2, carnosæ, maximæ, cuneatæ, angustiores quam in flosculo hermaphrodito, dentatæ. Antheræ longe exsertæ, lineares, luteæ. Pollen globosum, inæquale, læve. Rudimentum fœminei nullum.

Paleæ flosculi interioris hermaphroditi consimiles, sed exterior trivenia. Lodiculæ staminaque ut in mare. Ovarium subobovatum, glabrum. Styli duo, umbone nullo interjecto.

Stigmata ratione stylorum longa, ramis denticulatis. Caryopsis...

Spiculæ stipitatæ flosculi minores, et superior interior rarius hermaphroditus.

Obs. Genus habitu quodammodo Tripsaci, Hemarthriæ accedens, sed discrepans præcipue pedicellis flosculorum exteriorum glumisque interioribus spicularum sessilium solutis, nec axi adnatis, flosculisque exterioribus bipaleaceis masculis, nec unipaleaceis neutris. Ab Ischæmo differt præcipue paleâ exteriore flosculi hermaphroditi (superioris) muticâ.

Panicum Brunonianum. *Wall. et Griff. Mss.*

Paniculâ effusâ, spiculis 1 vel 2 infimis sessilibus et in axis excavationibus seminidulantibus, reliquis exsertis sæpissime solitariis, rachillâ in aristam spiculam duplo superantem productâ, foliis linearibus 3-veniis vaginisque glabris, ligulis 3-dentatis.

Hab. In aquis leniter currentibus profundis plagarum *Bheels* dictarum prope *Goalnagar;* florens Septembre.

Gramen fluitans: culmi longissimi, compressiusculi, ad geniculos radicantes. Vaginarum colla nuda. Ligulæ dens intermedius minor. Folia linearia, 2—3-uncialia, obtusiuscula, 3-venia, marginibus subsimplicibus denticulatis. Panicula terminalis, ambitu ovata, subglabra, axi inferne tetragonâ et excavatâ. Spiculæ 1 vel 2 infimæ in excavationibus seminidulantes; reliquæ exsertæ sæpissime solitariæ; rachilla scabra ultra spiculam quamque si unica, ultra terminalem si geminata, in aristam subulatam, antrorsum denticulatam producta. Gluma exterior minima, membranacea, evenia, subcrenulata, decolorata; interior lanceolata, acuta, mutica, venosa (sub-13-venia,) marginibus parum involutis subciliatis. Flosculi dissimiles; exterior masculus, duplo triplove major: palea exterior glumæ interiori similis, sed scabrella et margines magis involuti; interior duplo minor breviorque, membranacea, glabra, apice bifida, dente setiformi minimo interdum interjecto, venis 2 indistinctis infra apicem evanidis. Lodiculæ 2, paleæ interiori omnino externæ, oblongæ, subrhomboideæ, integræ. Stamina 3, antheris rubro-sanguineis. Paleæ floris interioris fœminei membranaceæ, muticæ, ovato-lanceolatæ, exterior evenia! interior latior, magis obtusa et involuta, incomplete bivenia. Staminum rudimenta tria. Lodiculæ 2 angustæ, interdum coalitæ? Styli 2, imâ basi coaliti, longi; stigmata plumosa, purpurascentia, ratione stylorum longissima. Caryopsis non visa.

This species belongs to the last section of this extensive genus, as given in Mr. Brown's Prodromus; it is interesting, as it seems to be the only species of the section hitherto found out of New Holland.

In the disposition of the sexes it agrees with Isachne, but differs from it in habit, in the relative size of its glumes, and in the consistence of its paleæ. From Chamæraphis this section differs only, we are told by Mr. Brown, in the number of its styles. The curious prolongation of the rachilla beyond the terminal spicula likewise occurs in some genuine Panica.

REFERENCES.

Plate XXIII. Vossia procera. Figs. 1, 2. Portions of a spike viewed on different faces. 3, Spicula detached. 4, Exterior glume viewed on its inner face. 5, Outer palea of the inner hermaphrodite flower three-veined (by a fault in the transfer the central vein in the original drawing has been left out.) 6, Inner palea of ditto two-veined. 7, Outer palea of exterior male flower, two-veined. 8, Inner ditto, two-veined. 9, Inner glume, viewed laterally and on its inner face. 10, Pollen. 11, Ovarium, or rather Pistillum, with the two lodiculæ and the three filaments in situ. 12, Outer view of lodicula. 13, Inner view of ditto, the lateral stamina separate with these. 14, Portion of a branch of the stigma.

Plate XXIV. Left half. Zizania? ciliaris. Fig. 1, Spicula. 2, Apex of pedicel, much enlarged. 3, Ditto with lower portion of the outer palea. 4, Lateral view of inner palea. 5, Lateral view of lodiculæ, stamina and pistillum; paleæ removed. 6, Pollen. 7, Pistillum. 8, Portion of a branch of the stigma. 9, Genitalia, relative situation, from a young spicula; anthers removed, and the lodiculæ displaced.

The same plate, right half. Potamochloa Retzii. Fig. 1, Spicula with its pedicel, that of the second pedicel removed at the time of expansion. 2, Portion of the pedicel, shewing the construction. 3, Outer palea, dorsal face. 4, Inner ditto ditto. 5, Ovarium, stamina and lodiculæ, the two former in situ, the latter displaced. 6, Pollen. 7, Ovarium, styles and stigmata with the lodiculæ in situ. 8, One of the divisions of the stigma. 9, Lodicula, inner face.

VIII.—*Notes on Delhi Point, Pulo-Tinghie, &c. and on some Pelagic Fossil remains, found in the rocks of Pulo-Ledah. By* Wm. Bland, *Esq. Surgeon H. M. S. Wolf.*

[Accompanying specimens presented to the As. Soc. 4th July, and deposited in the Museum, next to those presented by Dr. Ward from Penang and Queda.]

Where the Malay peninsula terminates in the China sea, there is a tongue of land, called by the natives *Delhi Point*, somewhere about 104 E. longitude, for it is not very correctly laid down. Reefs are found here, running to the southward and eastward, upwards of a mile at low water. Along shore, for the space of two or three miles, is strewed with large masses of *scoriæ* many feet thick, hard, and emitting a metallic sound. Specimens Nos. 1 and 4 will show the kind of vesicular masses mentioned; long lines of perpendicular strata are found stretching generally parallel to the shore, from three to

eighteen inches in thickness, of which No. 6 is a specimen. Indurated clayslate, No. 9, is likewise seen in layers running parallel, and in juxta-position to Nos. 1 and 2, of a few inches in breadth. Quartz was found, No. 5, in layers from one to two inches in thickness, accompanying the others and occasionally crossing them, and again continuing its course: imbedded masses of siliceous matter occurred both in the *scoriæ* and in the strata. A nucleus, five or six feet in diameter, was examined, which presented the appearance as if lava in a liquid form had been forced up from below, with a gyrating motion; circular layers having different shades of colour becoming wider and more extended, and were found edging away into straight lines parallel to the other strata. Of the tube marked No. 2, many were found from half an inch to two inches diameter; whilst No. 3 was got at the outer edge of the stratification. Of the remarkable specimen No. 10, abundance were seen, always standing up an edge: above the general level, and occasionally many feet in length, a piece might be found large enough to furnish forth the reticulations of a good-sized Gothic window.

At the N.E. point of the reef, within a few yards of the sandy beach, and dry at low water, was found a fossil tree, of which No. 11 is a specimen, standing at least 15 feet high and of considerable diameter, attached to a mass of rock of the same kind, and so good was the resemblance to a decayed tree, that some of the seamen called out, 'Come and see a tree grilled into stone by the heat.' The fossil in question must have been in a decayed state previous to its exposure to the mineralizing process, and it is the more remarkable, as it now stands, to all appearance, as it originally stood when alive:—it is the same as No. 9, composed of argillaceous schist. A specimen of coral No. 7, which has been exposed to the same general igneous agency as the masses scattered around, and found in the masses themselves, Madrepore No. 8, but the whole of the reef has coral of recent growth scattered over it, in all states and ages. Our stay on this point only extended to a few hours: little opportunity was given for minute observation, but it is a field well worthy the attention of future travellers in that quarter.

Pulo-Tinghie will be found in the charts to the northward and eastward of *Delhi Point:* this island rises to a considerable altitude, and terminates in a graceful truncated cone, with a lower cone seen to the southward of the former. The general surface presents irregular ridges radiating from the cone as a centre, running down to the circumference, i. e. the water's edge, which disposition of surface often obtains in volcanic islands. Be this, however, as it may; we found *Pulo-*

Tinghie densely covered with jungle, most difficult to penetrate, without more time than our public duties permitted ; hence the specimens are not numerous, and were found along shore, generally from masses lying about. No stratum was seen. The island terminates to the eastward in a high reddish coloured cliff, but at which we had no opportunity of landing.

Nine specimens marked Pigeon island, from a moderately high and cliffy islet some miles to the southward of *Pulo-Tinghie*, obtaining its name from the abundance of a fine cream-coloured pigeon, having the wings and tail tipped with black ; the same bird which is found on the small islands on the *Tenasserim* coast. No. 25, from a large mass partly beneath the surface of the sea. 21, high cliffs around, as well as No. 22.

Returning from the eastward, we had an opportunity of examining a group of small islands called *Pulo-Romania*. These islets, about two miles to the southward of *Point Romania* on the Malay peninsula, are partially covered with wood, and appear to be formed chiefly of granite of two kinds, which was seen checquered by fissures in all directions, and intersected by Nos. 34 and 35, found standing above the general level in narrow ridges, the granite being more easily disintegrated than the intersections themselves. No. 31 found in layers of various thickness, and No. 29 in large irregular masses some 15 feet in length, on shore or partly immersed in the sea.

Enclosed are thirty specimens, from a remarkable group of islands, lying between *Jan Salang*, (Junk Ceylon) and *Pulo-Pinang*, parallel to the kingdom of *Quédah* and in sight of the mainland. Passing over many islands visited, all of which will be found worthy the attention of the geologist, and the ornithologist, as well as the conchologist, I shall only mention *Pulo-Ledah*, as one of considerable importance, from the circumstance of pelagic fossil remains being found in the rocks.

Pulo-Ledah dedarat, literally in the Malay language, ' Tongue island in shore,' to distinguish this from another *Pulo-Ledah de laut*, or ' Tongue island at sea.' This island is about a mile and a half in circumference, and rises to the height of 4 or 500 feet, crowned by a castellated looking rock with perpendicular strata : the whole appears composed of limestone, having a considerable proportion of siliceous matter deposited in it, with veins of quartz a few inches in breadth occasionally intersecting it. The general rock was found stratified from one to three or four feet in thickness, lying at an angle about 45° dipping to the eastward ; all the surface, wherever exposed, is rough and uneven, of which Nos. 15 and 24 are specimens. Numerous caverns were found whose roofs not being so exposed were more smooth,

which caves have been evidently formed by the action of the waves impinging against the rocks; which action is still going on in certain situations. Some caverns were situated higher up, and not now exposed to the same agency, but it was noticed in a few of them that the entrances were smooth, similar to those in various parts of the world, which have been used, and smoothed down by the ingress and egress of wild animals: it turned out, however, in this case, that the agent that had worn these entrances was man himself, for these caves furnish him with troglodytic abodes during the season for collecting the nests of the Hirundo esculenta.

Your attention may be more particularly called to the north side of *Pulo-Ledah*, where will be found large masses of the same rock, from 20 to 30 feet in length and breadth, and 10 feet in thickness, lying in juxta-position, and no doubt originally deposited en masse, but having been raised unequally, have been broken into their present form and appearance. These masses were found rich in fossil remains; quantities of testaceous deposits were seen in all directions, partly above the general surface, undergoing disintegration along with the matrix in which they were imbedded. Of the fossil nautilus, No. 16, many were seen, as well as some others, concerning which some doubt may remain whether or not they are ammonites. As to the nautilus no doubt can exist, for the plain concave septæ dividing the chambers of the shell are well marked, with the siphuncle in the middle. Had time and better tools permitted, better specimens would have been procured; but the matrix was found very indurated, and it requires time to take such specimens out of hard stone, in a perfect state. The labourer, always worthy of his hire, would here be richly repaid for his time and trouble.

I add the rough sketch of a shell as it was found lying in the matrix, and of the natural size, which gives a tolerable idea of its general appearance. Siliceous cylinders No. 22, occur frequently, and a back bone was found in a fossilized state: from the round cup-like appearance of the vertebræ, it is most probably that of a fish.

Pulo-Ledah is one of the Lancavies, as well as *Pulo-Trotto*, (Giant's island,) an island, high, mountainous, and worthy of being better known; and *Pulo-Tloer* (Egg island) is a small one; but the whole of the islands in question will be found interesting, as on this subject of fossil remains many of your correspondents in India are devoting their time and attention with great success. I am sorry our time among the islands mentioned was so limited, but it is enough that I have pointed them out as a field worthy of future research, as well as the main land opposite.

IX.—*Fossil Remains of the smaller Carnivora from the Sub-Himálayas.*

By Lieut. W. E. Baker *and Lieut.* H. M. Durand, *Engineers.*

The specimens which are the subject of the following note form a part of the Dadúpúr Collection, and comprise varieties of the genera, *Felis*, *Canis*, and *Gulo*.

The comparison of such, with their existing representatives, must necessarily be less satisfactory than that of the large Pachydermatous genera, which being local in their habitats either contain few species, as the Elephant, Hippopotamus, and Tapir, or when, as in the Rhinoceros, the varieties are more numerous, the size of the animals, and the striking peculiarities of their osteology have claimed for them a minute description and comparison from Cuvier. On the other hand, the smaller carnivorous tribes have a far wider distribution, and their species are as numerous and as varied as the climates under which they are found; their distinctions are chiefly drawn from the external characters of the animals. Minute differences in their osteology, if they exist at all, escape the attention of the naturalists who describe them, and would, in fact, possess little interest except for the fossilist.

We should not be warranted in pronouncing any particular fossil to belong to an extinct species, without having previously compared it with all the known varieties of its genus; and even were such extensive means of comparison in our power, its result could not be decisive*, so long as there remained unexplored regions, whence new varieties might be derived. We shall, therefore, content ourselves with negative conclusions drawn from comparison of our fossils, with the skulls of those species only of their existing congeners now inhabiting the neighbouring districts, none other being at our command. Such conclusions, we hope, will not be without geological interest; as, if we succeed in establishing one or two points of marked difference, they will be sufficient proof that the animals now inhabiting these provinces are not the lineal descendants of those whose remains are entombed in the strata of their soil, and thence may be inferred the occurrence of some great geological change during the lapse of ages, which have intervened between the periods of their several existence.

Felis.

Of this genus there are traces of several varieties among our fossils, but as the larger ones, with the Hyena and Canis, may form the subject

* For instance, in the 52nd No. of the *Journal As. Soc.* Mr. Hodgson describes two new species of *gulo* and one of *felis*.

of a future paper, we will confine our present notice to the Cat. The cranium represented in fig. 1, Pl. XXVII. though somewhat mutilated, is sufficiently perfect for comparison. The most serious injury which it has sustained (as being the only one affecting the measurements) is a slight crush or compression, which has apparently flattened, and perhaps widened the cranium. The proportions between the fossil and the skull of a common-sized wild or jungle cat are as follows :—the length from posterior of occipital condyle to anterior of canine tooth being taken as the unit or modulus, and those dimensions only being collated, in which the greatest differences exist. The two skulls may be understood to correspond in other respects.

	Recent.	Fossil.
Length from post. of occipital condyle to ant. of canine tooth, assumed at	1,000	1,000
Greatest breadth of cranium opposite mastoid processes,	,508	,581
Height of occiput from lower margin of foramen magnum to top of transverse ridge,	,301	,333
Breadth across the occipital condyles,	,267	,346
Ditto measured externally across most prominent part of line of molars,	,427	,489
Height of orbit perpendicular, but measured in plane of orbit's margin,	,289	,257

The differences of proportion exhibited by the foregoing comparison are, as will be seen, very trivial. Setting aside the excess in breadth of the fossil's cranium, which if not caused is at least exaggerated by the crush before alluded to, there will remain no remarkable points of difference except in the diameter of the orbit, and in the width across the occipital condyles. The other variations probably exceed not what may be detected in the skulls of cats belonging to one species. There are, however, other differences of form not shewn by the measurements. In the fossil, the post. orbitary apophysis is more developed, and the plane of its projection more continuous with that of the frontal bone. The depression of the cranium in rear of this apophysis is more marked, giving a greater width to the temporal fossæ;—the bullæ of the mastoid processes have a more elongated shape, and are generally larger ; and the transverse ridge of the occipital bone is higher, sharper, and more prominent. All, or nearly all, these differences, tend to shew a greater development of the predacious faculties in the fossil,—a circumstance further confirmed by the teeth, which, though precisely corresponding in form with those of the cat, are somewhat larger and stronger.

The lower jaw occupying the central place in fig. 2, must have



fig. 1



fig. 6.

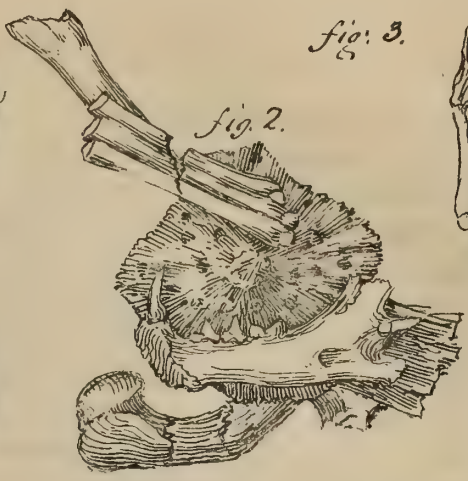


fig. 2.



fig. 3.

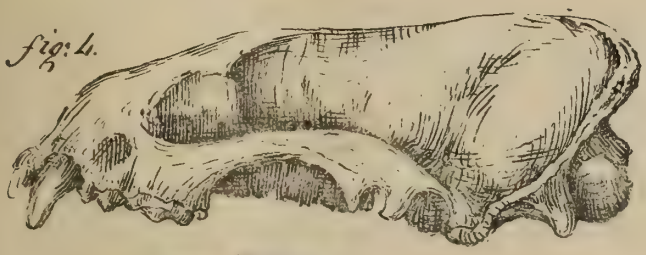


fig. 4.



fig. 5

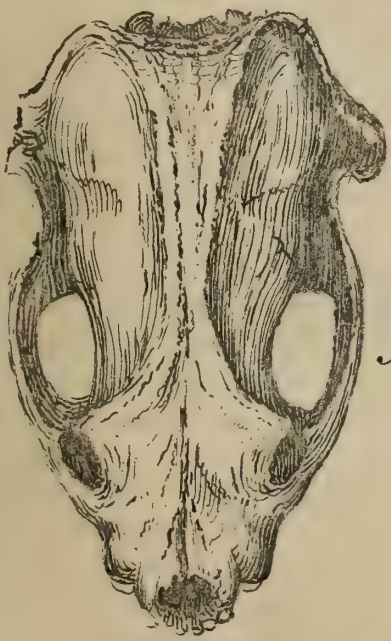


fig. 8.



fig. 7.

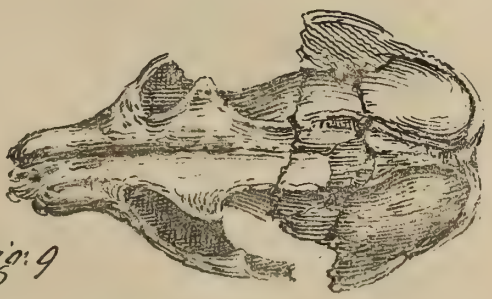


fig. 9



fig. 11

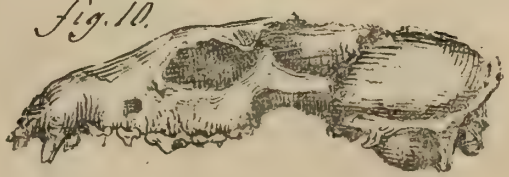


fig. 10.



fig. 12.

Scale ½ Nat. Size.

Sub-Himalayan Fossil Remains of the Smaller Carnivora

belonged to a smaller animal than that which owned the cranium : it presents no difference worthy of note, from the lower jaw of the wild cat. The humerus, tibia, and metatarsal bones, forming part of this interesting little group, appear to have belonged to the same individual as the lower jaw, and it is curious enough that their present bond of connection is the plate of a small crocodile. The carpal, metacarpal and phalangal bones represented in fig. 3, obtained from the same locality, though at different times, may possibly be assigned to the same or a similar animal.

GULO.

Of this genus we possess the fossil skulls of two individuals, one of which, represented in fig. 4, is nearly perfect : the lower jaws have been separated at their symphysis and otherwise somewhat mutilated, but as they were not found attached to the cranium, we may consider ourselves fortunate in having obtained them at all. The second cranium, fig. 7, has suffered considerable mutilation, and is without the lower jaws : we have, however, inserted it in the plate, because though otherwise less perfect, it has escaped a crush, which appears to have flattened fig. 4. Some differences of proportion between the two fossils would be accounted for under this supposition.

The recent skulls with which we have compared the above mentioned fossils belong to an animal known by the Hindustani name *Bíju* بِجُو identical, or nearly so, with the Cape *Ratel*, (*Gulo Capensis*, Desm.)

In classing the *Biju* and *Ratel* under genus *Gulo*, we follow the common system of arrangement; though, as remarked by CUVIER*, both the number and character of their teeth would rather place them with the *Mustela Putorius*. They appear, in fact, to be indebted to their plantigrade motion alone for a place among the *Gluttons*. The fossils now under consideration correspond in dentition with the *Ratel* and *Biju*, and the following table will shew that their resemblance to the latter in most other respects is very strong.

* Il convient d'autant mieux de comparer le Ratel au Glouton, que ces deux quadrupèdes sont à peu près de même taille ; mais outre que le Glouton a six molaires de plus que le Ratel, le crâne de celui-çi est plus large en arrière, son front moins élevé, son orbite moins cerné, ses arcades zygomatiques moins hautes, et l'apophyse coronoïde de sa machoire infèrieure beaucoup moins haute, plus large, et plus obtuse. Les rapports du Ratel avec le putois, d'apres ses dents et sa tête, sont certainement plus importans que les différences de marche. *Ossemens fossiles.*—Tom. IV. Chap. VI.

	Recent Biju.	Fossil.	
		Fig. 4.	Fig. 7.
Extreme length from posterior of occipital condyles to anterior of incisors, taken as the modulus, and assumed at	1,000	1,000	1,000
Breadth measured across mastoid processes,	0,581	0,592	0,610
Greatest breadth of cranium opposite mastoid processes,	0,467	0,443	0,474
Least ditto ditto at temporal fossæ,	0,226	0,258	0,262
Height of occiput from inf. margin of foramen magnum to sup. of occipital ridge,	0,318	0,307	0,343
Breadth of ditto from point to point of styloid processes,	0,335	0,361	0,394
Ditto across the occipital condyles,	0,243	0,241	0,248
Ditto of frontal from point to point of post. orbitary apophyses,	0,286	0,327	0,313
Ditto greatest across zygomatic arches,	0,546	0,543	0,561
Ditto exteriorly across the superior canine teeth,	0,220	0,238	0,236
Perpendicular diameter of occipital foramen,	0,088	0,091	0,108
Length from anterior of canine teeth to post. of tuberculous teeth, measured externally,	0,282	0,287	0,287
Breadth of upper jaw measured across carnivorous molars,	0,347	0,339	0,325
Greatest antero-posterior diameter of canine teeth,	0,058	0,071	0,067
Width of tuberculous molars,	0,081	0,073	0,069

The two fossils, though differing considerably from each other, agree in the following points of dissimilarity from the recent skull. Their canine teeth are larger and stronger, and their tuberculous molars smaller; the two lines of molars converge towards the muzzle considerably less in the fossil than in the recent, and the individual false molars are set less obliquely to the line of maxillary. The frontal is wider between the orbits; the post. orbitary apophyses more prominent, and the depression of the cranium in rear of them less deep; the exterior portion of the mastoid processes has a far greater development (fig. 8); the transverse occipital ridge is thicker, more rugged and more prominent, and projects considerably beyond the plane of the occiput in the prolongation of that of the parietal bones (fig. 5). Measurements of the recent and fossil lower jaws exhibit no differences save in the canine teeth, which severally correspond with the same teeth in the upper jaw. There is, however, in the fossil (fig. 6) a deep depression in the ramus, which in the recent species is nearly flat. In our specimen this depression is as marked as in the tiger and other feline animals. The differences above noted, as before remarked with regard to the cat, tend to prove that the ancient species was even more powerful and savage than its present representative, the *Biju* itself, by no means deficient in these qualities. The three recent skulls examined on this occasion had all suffered more or less from the violence to which the vigorous self-defence of the animals had obliged their captors to resort.

CANIS VULPES.

The specimen represented in figs. 9 and 10, though fortunate in possessing both lines of molars complete, has suffered much from a

crush by which the whole posterior portion of the head has been flattened and disfigured. The dimensions selected for comparison in the following table are those least likely to be affected by the accident. Our recent specimen belongs to an adult male fox, of a species common in the N. W. provinces of India. Its size, the colour of its fur, and other external characters, appear to correspond with the description of *C. Corsac* (Pallas), which Cuvier is inclined to identify with *C. Bengalensis* of Pennant—figured also in "Hardwicke's Illustrations," Pl. II. Parts XV. and XVI.

	Recent.	Fossil.
Length from occipital condyle to anterior of canine, taken as modulus, and assumed at	1,000	1,000
Breadth measured across mastoid processes,	,390	,433
Least breadth of cranium at the temporal fossæ,	,205	,206
Breadth from point to point of styloid processes,	,253	,298
Ditto across occipital condyles,	,202	,251
Ditto of frontal from point to point of post. orbitary apophyses,	,287	,295
Greatest breadth measured externally across both lines of molars,	,338	,319
Horizontal diameter of occipital foramen,	,130	,133
Length occupied by line of molars and canine taken together,	,500	,470
Ditto ditto molars alone,	,410	,415

The chief differences here exhibited are those of greater breadth in the posterior portion of the fossil's head, and must, though they appear natural, be liable to the suspicion of having been caused more or less by the crush before alluded to; but there are some points of dissimilarity which must be considered free from this objection. The transverse occipital ridge is thicker and higher in the fossil; the post. orbitary apophyses are altogether broader and more prominent; the hollow or depression in their upper surface, forming a valley between the outer edge of the apophysis and the swell of the frontal, (constituting one of the distinctions between the fox and the other varieties of canis) is in the fossil more marked. From the rear of these apophyses start two ridges, which at first converge towards the occiput in a curvilinear direction, until the distance between them is reduced to about half an inch, after which they run nearly parallel for some distance, and then converge again, till they unite near the occiput and become blended with the parietal crest. We have been particular in describing this formation, as a very similar one was observed by Cuvier in the skull of the "Renard Tricolor," *C. cinereo-argenteus*, Linn. It will be observed from the table of measurements, that the length occupied by the molars and canine teeth together is less in the fossil, while that occupied by the molars alone is proportionally greater. This difference is only apparent, and is caused by the ad-

vanced position of the first false molar close to the root of the canine; the tooth is probably a deciduous one, not yet replaced by the permanent molar; the unworn state of the other teeth also attesting the youth of the fossil, at the period of its demise. The lower jaws, figs. 11 and 12, are not sufficiently perfect to afford any satisfactory measurements. Fig. 11 is the external view of the left; and fig. 12 the internal of the right lower jaw.

To the foregoing observations we have nothing further to add than that, in our opinion, they point out sufficient proof of specific differences between the several objects compared; but, for the reasons before adduced, we must limit our conclusions to this, and cannot therefore venture upon giving new names to our fossil species.

Measurement of Fossil Skulls, &c. represented in Plate XXVIII. figs. 1 *to* 10.

Detail of Measurement.	Felis fig. 1.	Felis fig. 2.	Gulo figs. 4 5 & 8.	Gulo fig. 7.	C. Vulpes 9 & 10.
	ins.	ins.	ins.	ins.	inches.
Extreme length from post. of occipital condyles to anterior of incisor teeth,	3,50	..	5,51	5,08	4,09
Ditto ditto ditto canine ditto,	3,27	..	5,13	4,86	3,83
Breadth measured across mastoid processes,	1,67	..	3,26	3,10	1,66
Greatest breadth of cranium opposite mastoid processes,	1,90	..	2,44	2,41	1,71
Least ditto ditto at temporal fossæ,	1,28	..	1,42	1,33	0,79
Height of occiput from lower margin of occipital foramen to top of transverse ridge,	1,09	..	1,69	1,74	0,90
Breadth from point to point of styloid processes,	..	..	1,99	2,00	1,14
Ditto across the occipital condyles,	1,13	..	1,33	1,26	0,96
Ditto of frontal from point to point of post. orbitary apophyses,	1,80	..	1,80	1,59	1,13
Greatest breadth across zygomatic arches,	2,72	..	2,99	2,85	..
Breadth measured externally across superior canine teeth,	1,00	..	1,31	1,20	..
Ditto ditto most prominent points of line of molars,	1,60	..	1,87	1,65	1,22
Perpendicular diameter of occipital foramen,	0,45	..	0,50	0,55	..
Horizontal ditto ditto,	0,55	..	0,62	0,60	0,51
Length from exterior of incisors to anterior of palatal sinus,	1,52	..	2,40	2,00	..
Ditto from anterior of palatal sinus to lower margin of occipital foramen,	1,68	..	2,56	2,70	2,05
Ditto occupied by molars and canine teeth, taken together,	1,24	..	1,58	1,46	1,80
Ditto ditto molars alone,	0,95	..	1,25	1,17	1,59
Diameter of orbit perpendicular, but measured in plane of orbit's margin,	0,84	..	0,62	..	0,58
Ditto ditto from point of post. orbitary apophysis to ant. margin of orbit,	..	..	0,79	..	0,74
Greatest antero-posterior diameter of canine tooth,	0,19	.	0,39	0,34	0,18
Width of tuberculous tooth, (in *Felis* and *Gulo*,)	0,14	..	0,40	0,35	..
Lower Jaw.—Length from posterior of condyle to anterior of canine,	..	2,13	3,20	..	..
Ditto from ditto ditto to posterior of molars,	..	0,98	1,48	..	..
Ditto occupied by molars and canine teeth, taken together,	..	1,19	1,74	..	..
Ditto ditto molars alone,	..	0,78	1,37	..	..
Depth of lower jaw taken in front of carnivorous tooth,	..	0,44	0,67	..	0,45
Greatest antero-posterior diameter of canine tooth,	..	0,20	0,38	..	0,13

X.—*Continuation of a Paper (Journal, May, 1835), on the Heights of the Barometer as affected by the Position of the Moon. By the Rev.* R. Everest.

In a comparison of the heights of the Barometer with the position of the moon in declination, (See Journal, May, 1835,) I stated that it appeared, that though the greatest depressions coincided, or nearly so, with the times of the moon's maximum declination, yet that many of the greatest elevations held a similar situation. To ascertain whether this idea was well-founded, the daily barometric heights were taken from the 4 P. M. column of the Meteorological Registers of the Journal; then the differences either in excess or defect from the monthly mean, were noted and placed in different columns according to the state of the moon in declination, as given in the Nautical Almanacks for noon of the same day. Then the average of each column was taken for the year, and continuing the process for the 13 years of which the Meteorological Registers are extant, a general average was finally taken of the whole, which came out as follows:

Moon's Decl.	25°	20°	15°	10°	5°	0°
Average amt. of variation from the monthly mean,	·060	·055	·056	·055	·054	·052

If it be objected that this difference, between the two extremes of the line, of ·008, be small, we may answer that small as it is, it is nearly $\frac{1}{7}$th of the whole amount. The heights of the barometer at London for a period of 24 years were then examined in a similar manner, only that instead of classing the differences in columns according to the number of degrees of the moon's declination on the same day, they were classed according to the distance of the day on which the observation was taken, from the day of maximum declination. Thus, the number of days from maximum north to maximum south declination being nearly 14, the differences were arranged in 14 columns, numbered in this way:

1 2 3 4 5 6 7 8 9 10 11 12 13 14

and as a whole revolution from one time of maximum declination to its succeeding one is something less than 28 days, a column was occasionally left blank to keep the maxima always in the 1st and 14th. This method is rather less troublesome than the former one adopted, but it does not answer so well for a long series of years, as the moon's maximum declination is very different in different years:—for example, in 1820, it was between 28° and 29°, and in 1829, between 18° and 19°. The average, therefore, was taken for the six years in which the declination was greatest, viz. 1818, 1819, 1820, 1821, 1822, 1823. The maximum declination was then always above 25°,

so that the first column would correspond with the left-hand column of the former classification. North and south declination were then put together, and the results came out thus :

Days, ...	1	2	3	4	5	6	7
Average amount of variation from the mean, ...	·235	·221	·223	·227	·216	·218	·217

The average was next taken for nine years, in which the declination was at a medium, say between 26° and 21°, so that the first column would nearly correspond with the second column of the former classification ; the seventh column being, as before, that on which the declination was least. The years were 1814, 1815, 1816, 1817, 1824, 1825, 1826, 1833, 1834, and the results were :

Days	1	2	3	4	5	6	7
Average amount of variation from the mean, ...	·245	·220	·215	·200	·201	·215	·225

The average was again taken for nine years, in which the declination was least, viz. between 21° and 18° ; that is to say, 1810, 1811, 1812, 1813, 1828, 1829, 1830, 1831, 1832. The first column, in this case, would nearly correspond with the third in the classification of the Calcutta barometer. The results were as follows :

Days, ...	1	2	3	4	5	6	7
Average amount of variation from the mean, ...	·206	·214	·212	·221	·228	·225	·230

In this last case no increase of variation is perceptible towards the maximum, but then the maximum did not usually exceed 20°, or at the most 21°.

I have as yet said nothing about the perigee, because it has been proved in Europe that the perigee produces some effect on the weather. With a view to ascertain whether the effect produced was the same as that occasioned by the increase of declination, I took the same variations of the London barometer, as before, for 24 years, and arranged them in different columns according to the state of the moon's semi-diameter on the days on which they were taken. The general average came out thus :

☽'s ½ diam.	1000″	990″	980″	970″	960″	950″	940″	930″	920″	910″	900″	890″	
Av. Var. Bar.	·247	·227	·207	·229	·226	·219	·216	·214	·209	·224	·205	·218	·211

Here there appears a tendency to an increase of variation with an increase of semi-diameter ; but on examining the differences of the Calcutta barometer, no such increase could be made apparent. It remains, therefore, in doubt whether, in this climate, such an increase does exist—or whether, owing to some mistake, yet undetected, it has not been made apparent. I am inclined to the latter supposition—from this consideration—1st, If no increase exists, no results could be traced from it ; 2ndly, If an increase exists, though not, at

present, apparent, some remote results would probably be observed, which might be ascribed to it, as their cause.

Thus, with an increase in the variation of the heights of the barometer, an increase both of dryness and moisture would follow. As an increase of variation also attends an increase in declination, it is probable that the greatest effect would be perceived when the two causes were in co-operation together. Now as there are certain years in which the moon's perigee fell on the same day with her maximum declination, either north or south, it is probable that, in those years, the extremes of weather, both of dryness and moisture, would be experienced. Is this then the case? Are those years in which the day of perigee is the same as the day of maximum declination, also those in which the extremes both of drought and moisture occur! By such results let these speculations be tried. For our present purpose, which is only to obtain some useful indications, the difference between an absolute error and a barren verity is not worth mentioning.

XI.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 5th October, 1836.

The Rev. Dr. Mill, Vice-President, in the chair.

Lieutenants Newbold and S. Tickell, proposed at the last meeting, were balloted for, and duly elected Members of the Society.

Mr. Vincent Tregear, proposed at the last meeting, was, upon the favourable report of the Committee of Papers, unanimously elected an honorary member.

Mr. G. F. MacClintock was proposed by Mr. Macnaghten, seconded by Dr. Mill.

The Secretary then read the Report of the Committee of Papers on Mr. C. Brownlow's proposition relative to the publication of the *Alif Leila.*

[See below.]

Resolved—That the Society approve and adopt the Report of the Committee:—that it feels honored by Mr. Brownlow's desire to publish the work under its auspices; and that in addition to its own subscription, the prospectus shall be circulated among individual members, and the patronage of the Government shall be respectfully solicited to Mr. Brownlow's undertaking.

Library.

The following books were presented:—

A Discourse concerning the influence of America on the mind, being the Annual Oration delivered before the American Philosophical Society on the 18th October, 1823, by C. J. Ingersoll, Esq.—*by the Society.*

Notice Historique sur Charles Telfair, Esq. Fondateur et President de la Societé d'Histoire Naturelle de l'ile Maurice, &c. &c.; by M. Julien Des Jardins—*by the Author.*

Nouveaux Choix des Poesies Originales des Troubadours; by M. Raynouard —*by the Author.*

Opinions on various subjects, dedicated to the Industrious Producers; by Wm. Macbere, Esq.—*by the Author.*

The Indian Journal of Medical and Physical Science—*by F. Corbyn, Esq. Editor.*

Gay's Fables translated into Bengali Poetry, by Mahárája Kali Kissen Behadur—*by the Translator.*

Conclusion of the Guldestah, or Nosegay of Pleasure, by Múnshí Mannu' La'l—*by the Author.*

Map of the Indus River and of the neighbouring countries, from the recent surveys, compiled in the Surveyor General's Office—*by Mr. Tassin.*

Royle's Himálayan Botany, 9th part—*from the booksellers.*

Read a letter from the treasurer of the Academy at Bordeaux, Mr. Dutrouilles, forwarding by the hands of Dr. Lavergne a packet of seeds for the Botanic Garden of Calcutta, and requesting in return such seeds from Tibet or other colder parts of India as are likely to thrive in France.

The seeds have been made over to Dr. Wallich, who will kindly reply on the subject to Bordeaux.

Literary and Antiquarian.

An account of some of the Petty States lying north of the Tenasserim Provinces, drawn up from the journals and reports of Dr. Richardson, was submitted by Mr. E. A. Blundell, Commissioner of these new provinces; also a sketch of the history of *Labong*, by the same.

Capt. A. Cunningham, Engineers, A. D. C., presented to the Society the very extensive collection of statues and other specimens of Bauddha sculpture discovered by him in his exploration of the well known monument or tope in the road between Ghazipur and Benares. The following note on these interesting relics was read.

"The stone figures, bas-reliefs, and inscriptions were all found near Sárnáth, a Buddhist monument about eight miles from Benares. The greater number were dug up within a small space of 10 feet square, and nearly all in an upright position side by side. Along with them were 40 or 50 others now lying near Sárnáth, and which were left behind from their being of the same description as those now presented to the Society, and from their being in a less perfect state, and from their wanting inscriptions.

I learned from a villager that when Jagat Singh the Dewan of Cheth Singh, Rája of Benares, was digging near Sárnáth for building materials for the *ganj* which now bears his name, his workmen lighted on a small temple the walls of which they carried away—and it was within that temple that these figures were then seen; but owing to some superstitious feelings on the part of the workmen, no steps were taken at the time for their removal.

The three seated female figures, one bearing an inscription, were found in the ruins of a small temple consisting of only two rooms, and the long bas-relief containing the alligator's heads was discovered in a stone tank 13 feet nine inches square, upon clearing away the rubbish from the pukka terrace which surrounded it.

I am induced to offer these figures to the Society, in the hope that the inscriptions upon their pedestals may be translated, and help to throw some light upon the Buddhist religion, as well as upon Sárnáth and the ruins of the different buildings in its neighbourhood."

The special thanks of the Society were voted to Capt. Cunningham for this valuable contribution to the Museum.

Physical.

The Secretary presented on the part of Mr. Dean, Assoc. Mem., some fine fossil specimens lately obtained by him from the bed or banks of the Jumna river.

Mr. Dean had maintained for some time an envoy to explore such parts of the river as he had not been able himself to examine. Out of the produce of this adventure he had selected the specimens now transmitted, because they served to settle the question of the existence of three animals in a fossil state, which had hitherto been doubtful,—or rather which had been for the first time advanced with hesitation from his former collections in the Jumna;—the camel, the buffalo, and the antelope.

They consist of the femur and cranium of the fossil buffalo, about one-sixth larger than the present race;—fragment of the femur of a camel; cores of the horns of an antelope, and waterworn portions of the horn of the axis.

To make the recognition of these fossils as clear as possible, Mr. Dean had placed side by side of each the corresponding recent bone, so that no doubt could remain of their identity. The splendid discoveries in the Siválik range have meantime removed all uncertainty on the subject, and have even pointed out two distinct species in the fossil camel, on which a paper has just been printed in the Researches.

A paper by Messrs. Falconer and Cautley was submitted on the *fossil bear* of the Siválik range, with drawings pointing out variations from the existing species.

The knowledge of this animal is derived from two fine fragments of the head. The chief peculiarities are observable in the teeth, which are constructed more after the type of the higher carnivora than any other described species of the genus.

A paper entitled "Some remarks on the development of *Pollen*," was submitted by Dr. W. Griffith, Mad. Est.

Indications of a new genus of insessorial birds—by Mr. B. H. Hodgson.

A Table of the breadth, current, and depth of the river *Satlej*, from *Hari kē patan* to its junction with the Indus at *Mithankot*, was communicated by Capt. C. M. Wade.

Also a note on the spring of *Lohand Khár*—by the same officer.

Two large cases containing a fine collection of butterflies, moths and other insects from *Silhet*, was presented by Mr. George Loch, C. S.

Observations concerning certain interesting phenomena manifested in individuals born blind, on their restoration to sight, were communicated by Dr. F. H. Brett.

Report *of the Committee of Papers on the* Alif Laila.

The Committee having deputed the examination of Major Macan's manuscript to those of its Members most eminent for their knowledge of the Arabic language and literature, think it will be more satisfactory to submit the separate minutes of those gentlemen to the Society than to embody them in a general report.

They are unanimous in their opinion of the genuineness, general correctness, and value of the manuscript, as well as in advocating the support of Mr. Brownlow's undertaking: and they think the patronage of the Government should also be respectfully solicited. For the correction of the press, they believe Mr. Brownlow to have made the best arrangement;—nevertheless, as he has solicited permission to publish the work under the auspices of the Society, it may be proper that a file of the sheets as printed should be furnished to the Secretary to be occasionally submitted to Members of the Committee and other competent judges of their accuracy. They consider the price fixed by Mr. Brownlow, 48 Company's rupees, for four royal octavo volumes of 600 pages, to be very moderate, and they trust he will experience the advantage of it in a full list of subscribers.

For the Committee,

J. Prinsep, *Secy.*

Minute by Mr. W. H. Macnaghten.

Of the genuineness of Mr. Brownlow's manuscript, there cannot, I think, be the slightest doubt. I have compared the third volume of the "Contes Inedits," by M. Trebutien, with the fourth volume of the manuscript, and, as far as I can judge from reading three or four of the commencing and concluding pages, and looking over some of the intermediate pages of each of the six last tales, I believe that they correspond almost exactly.

I have also carefully looked through the third volume of the MSS. The anecdotes which are at the end of the third volume of the French translation, are contained in this volume; but they do not, in the Arabic MSS. appear to be so numerous. They are chiefly introduced between the stories styled "Histoire d'Adjib et de Gherib," (the last story of the first volume of Trebutien,) and that styled "Des ruses de Dalilah et de la fille Zeinub," (the first story of the second volume of Trebutien.)

I have not had time to compare all the "Anecdotes." They are not entered in the same order as in the French version, owing to which the comparison would necessarily be a work of time—but I have been able to compare the anecdotes styled "Divorce et second mariage de Hind fille de Naaman," page 464, and that styled "Conduite du Vizier Ibn Aamir," page 487, and I find that they minutely correspond with the Arabic MSS.

On comparing the story styled "Histoire d' Abdallah l' habitant de la Mer et d'Abdallah l' habitant de la Terre*," I was much struck with the mutilated state of the story as contained in the French version. I subjoin a version in English of the French and of the Arabic stories. It will be seen at once, how much the former has been shorn of its fair proportions.

Story of Abdallah the inhabitant of the Sea, and of Abdallah the inhabitant of the Land.

There was once a fisherman, called Abdallah, who was father of a numerous family. All his riches consisted in his nets, with which he went every day to the sea shore to supply the wants of his family; he lived in this way from day to day. His wife was confined for the tenth time of a boy: that very day there was nothing at all in their house. The wife told her husband to take his nets, and to throw to the good luck of the new born. The fisherman took his nets, and threw them in with prayers for the happiness of his son. When he drew them out the first time, they were filled with sand, gravel, reeds, and mud, and he did not find even one single fish. It was the same also the second and third time. In vain did the poor fisherman try another place: the night overtook him before he had caught the least thing.

"Great God!" cried he, "is this the luck of my new born! has thou created him that there may be no happiness for him! It cannot be so: he who has opened his lips to form a mouth, has taken care of his existence." Overcome with sadness, he threw his nets upon his shoulders and slowly took the way to his dwelling, thinking what he could say to his starving children and his lying-in wife. He passed before the shop of a baker where he was wont to buy bread. Seduced by the smell of the hot bread, poor Abdallah stopped before the shop, and cast looks of starvation on the bread just brought from the oven. "Do you wish for bread?" asked the baker of him. "I would willingly have some for my poor children," replied the fisherman, "but I have no money to pay for it, for I have not caught a single fish to-day: nevertheless, if you are willing, I will leave my nets in pledge." "How," replied the baker, "could you earn money to pay me, if you leave me your nets in pledge? Hold, here are ten loaves, what you are accustomed to take, and, moreover, ten pieces of money which I lend you. If

* Page 89 of Vol. III. of Trebutien.

you are successful in your fishing to-morrow, you will pay me, and if not I will give you credit." "God will reward you," said the fisherman, taking the ten loaves: and he went to the market to buy some vegetables. The next morning he went out very early, and threw his nets all the day without catching any thing. In returning home that evening he did not dare to approach the baker's shop; but the latter having seen him, called him and gave him, as he had done the night before, ten loaves and ten pieces of money. Things went on in this way for forty days, and the fisherman was in despair to see his debts thus increasing without any means of discharging them. The forty-first day he said to his wife, "I am going to tear my nets in pieces; because I see that I ought no longer to reckon on gaining my livelihood in that manner. I am ashamed of being such a burden to the baker, and I must do some other business to pay what I owe." "God is great," replied the wife; "and since he has given us such a generous benefactor, he will grant us also the means of clearing ourselves to him. Do not despair then, continue to throw your nets and put confidence in God." The fisherman followed the advice of his wife; he threw his nets in the name of God, and said, "Be favourable to my fishing, O thou who dispensest the gift of destiny! If I catch a single fish I will carry it to my benefactor." The nets this time were of an extraordinary weight. Abdallah worked with all his strength to bring them to the shore, but the poor fisherman, to his great despair, found nothing but a dead ass, which exhaled a pestilential smell. "There is neither might nor power, but in God," cried Abdallah, in clearing his nets of the carcase. "It is my accursed wife," added he, "who gave me this fine advice; I told her that I was going to give up the business of fisherman, but no, 'God is great; do not despair, continue to throw your nets.' See what it is to follow women's advice! Nevertheless, I am going to tempt fortune again to-day for the last time."

The fisherman sought another place to avoid the stench of the ass, and threw his nets: they were still heavier this time than the first, and Abdallah found in them a being with a human form. At first he thought it was one of those genii that Solomon had cast into the depth of the sea, after having shut them up in brazen vessels. He, therefore, cried "Pardon! pardon! O Genii of Solomon!" "Fear nothing," replied the figure in the net, "I am a human being like thee; the only difference which exists between us, is that I live in the depth of the sea, and you inhabit the earth." "Then," replied the fisherman, reassured by these words, "you are neither a genii nor a demon?" "Not more the one than the other," replied the inhabitant of the sea; "I believe in God and his Prophet." "But who threw thee into the waves?" I am, by nature, an inhabitant of the sea, and I serve God. When I was caught in the nets, I was trying to be useful to thee, and I allowed myself to be taken; because it would not have been difficult for me to break your nets, if I had wished to escape; but I recognized the finger of God in this event, and I see that we have both been created to be brothers and friends. The earth produces grapes, melons, peaches and pomegranates: the sea abounds in coral, in pearls, in emeralds, and in rubies. Bring me fruit, and I will fill your basket with the precious stones which are found in the sea." "This proposition suits me marvellously, my brother," said the fisherman; "swear to me that you will keep your promise, and recite the first chapter of the Koran." When the first chapter was recited, the fisherman laid down his nets, and asked his companion his name. "I am called Abdallah of the sea; and thou, what is thy name?" "It is truly extraordinary," said the fisherman; "my name is also Abdallah, and to distinguish us one from the other, I will call myself Abdallah of the land." "Very well," replied Abdallah of the sea; "we have been created one for the other;—wait for me here an instant, I am going to search for something which I wish to make you a present of!" At these words he plunged into the sea to the great grief of the fisherman, who regretted having given him his liberty. "If I had kept him, thought he to himself, I could have shown him for money as a curiosity, and in that manner I might have gained my livelihood."

An instant after the inhabitant of the sea re-appeared, with his hands filled with rubies, pearls, and emeralds. "Do not take it ill," said he to the fisherman, "that I have not brought you more of them; I had nothing to put them in, but I will

give you as many to-morrow again, and every day, if you will come here at sun-rise." Transported with joy, the fisherman went to the baker's, to whom he gave all his pearls and precious stones, thanking him for all the favors which he had hitherto heaped on him. After that loaded with as much bread as he could carry, and after having bought with the money which the baker had given him, meat, fruit, and vegetables, the good Abdallah ran home to inform his wife of the happy adventure which had happened to him.

"Keep well your secret," said his wife to him; "it is a thing that ought not to be related to every one." "If I must conceal it from every one," replied the fisherman, "I cannot at least make a mystery of it to the baker my benefactor."

The next day, having got up very early, the fisherman went with a basket of fruit to the sea shore, which he reached before sun-rise. He cried there: "Where art thou, Abdallah of the sea?" "What will you?" replied a voice from the depth of the waves; and at the same instant the new friend of the fisherman came out of the sea with a load of emeralds, rubies, and pearls. After having breakfasted together, they retired each going his own way. The fisherman gave, in passing, two more necklaces of pearls to the baker, and carried the rest home. He went afterwards to the bazar, and shewed all the pearls and precious stones to the syndic of the jewellers. "Stop him," cried the latter; "he is the thief who has stolen the queen's pearls!" Abdallah allowed himself to be loaded with bonds, and to be conducted before the king without saying a word. They presented to the queen the pearls which they took for hers, but she declared that the pearls were much handsomer than those which had been stolen from her; that they did not belong to her, and that she would buy them at any price. "Retire, infamous informers," said the king; "as if God could not give riches to the unfortunate also! Retire." When the jewellers had departed, the king turned towards Abdallah: "Now inform me from whence did you get this treasure. I am a king, and I do not possess such precious stones." Then Abdallah related to him his connection with Abdallah of the sea. "Venerable man," said the king, "riches ought to be joined to power;—as long as I reign you need not fear violence; but I would not be answerable that after my death my successor will not cause you to be put to death to seize on your treasures. I wish, therefore, to give you my daughter in marriage and to make you my vizier, so that after me envy may not assail you." After that the king ordered Abdallah to be conducted to the bath, and caused him to be dressed in magnificent clothes. They sent letters for his wife and children, who were loaded with marks of honour. The contract of marriage was drawn up according to all the forms. Abdallah of the land gave as portion to the princess all the treasures which he had received from Abdallah of the sea. The next day the king having observed the vizier betake himself with a basket of fruit on his head to the sea shore, asked him what he meant by so doing. Abdallah replied that he was carrying breakfast to Abdallah of the sea. The answer displeased the king. "This conduct, my son-in-law," said he to Abdallah, "is not suitable for a vizier. Take your choice to remain in the palace, or to drop instantly your load."

Up to this point the French and Arabic versions correspond with great minuteness. The French version, however, terminates in a very abrupt and unsatisfactory manner. It conveys no moral, and leaves Abdallah the inhabitant of the land to enjoy his good fortune, notwithstanding his ingratitude towards his benefactor. The French version proceeds—"Abdallah liking better to preserve his place and the favour of the king, returned no more to the sea shore and lived happily to the end of his days."

The Arabic version is altogether different, and if it possesses no other merit, it has at least the advantage of conveying a moral and teaching a cheerful resignation to the will of Providence: it proceeds thus:—

"Abdallah said, I fear to break the promise which I have made to him. I shall then be accounted a liar, and the world will accuse me of falsehood." The king replied, "You are right. Go, and God be with you." He then went into the city, and the people recognized him. He overheard them saying, "This is the

king's relative: he is going to exchange fruits for jewels;" but they who were ignorant and were not acquainted with him said, "O fortunate man, stay a little, and let me form acquaintance with you." He paid no attention, however, to any one, and proceeded onwards till he joined Abdallah of the sea, and presented him with the fruit and exchanged them for jewels. Having so done, he returned to the baker's shop, which he found closed, and learnt that this had been the case for ten days. He then proceeded to consummate his marriage with the daughter of the king, with whom he lived on terms of affection. He went daily to the man of the sea and returned by the baker's shop, but found it always locked. He was at a loss to conceive where the baker had gone, and asked the neighbours where he had gone, and what had happened to him. They told him in reply, that the baker had fallen sick and could not leave his house. Having inquired where his house was situated, Abdallah sought him out. His friend seeing him out of the window bearing a full basket, on his head, descended and opened the door, and throwing himself upon him, embraced him and cried. Upon this, Abdallah said to him, "Where have you been, my friend, this long time; I have come daily to your shop, but have found it shut, and have been unable to find you. Are you in distress?" The baker replied, "No, but I heard that the king had seized you and charged you with being a thief, whereupon I became afraid, and shut up my shop and concealed myself." Abdallah answered, This is true; and then recited his adventures with the jewellers and the king, and how he had married the king's daughter, and had been made his vizier. He further desired him to take as his portion what was in the basket, and not to be afraid. Saying this, he left him in a happy mood, and returned to the king with his basket empty. The king said to him, "O! kinsman, I fancy that you could not have met your friend Abdallah of the sea to-day." He replied, "I did meet with him, but what I obtained from him I gave to my friend the baker, to whom I am under an obligation." The king asked who is this person—to which he replied, he is a baker by profession, and behaved to me in such and such a manner during the period of my distress, and never neglected me. The king asked his name. Abdallah, said he, is called Abdallah the baker—my name is Abdallah of the land, and the name of my companion is Abdallah of the sea. The king rejoined, My name also is Abdallah*, and the servants of God are brothers; send and bring him, we will make him our second vizier. Then were sent for him the vizier and the nobles, who caused him to be clothed in the habiliments of a vizier, and brought him into the presence of the king. He was then made the second vizier, Abdallah continuing the first.

Abdallah of the land, the first vizier of the king, continued after this fashion a whole year, and never omitted for a single day to go with a basket of fruits and to return with a basket of jewels and precious stones, and when fresh fruits were not procurable he used to carry raisins, almonds, walnuts, figs, and such like. Whatever he took was cheerfully accepted, and in return his basket was filled with jewels according to custom. One day it happened that he took a basket of sweetmeats. Abdallah of the sea accepted it, and took his seat upon the land by the sea shore. They entered into conversation and mutually told stories, when the following dialogue occurred. "Is it true, my brother, that the prophet (on whom rest the peace and blessing of God!) is buried among you on dry land, and do you know where he is buried? I do, replied he of the land. In what place? In a city called Yusrub. Do the inhabitants of the land go to visit his tomb? Yes. Happy then, exclaimed Abdallah of the sea, are you denizens of the earth, that you are enabled to visit the tomb of this gracious, clement and merciful prophet who intercedes for all those who perform the pilgrimage! Have you, my brother, ever visited his tomb? No, I was a poor man and had not enough to pay my expenses on the road, but since I became acquainted with you and you have bestowed upon me this exceeding prosperity, it is a duty incumbent upon me to do so. I have a strong desire to visit the holy city, and nothing but the affection I have for you prevents my doing so. I cannot, however, bear to part with you for a single day. Do you, said he of the sea, prefer my friendship to that of the prophet (on whom be the blessing and peace of God), who will

* Servant of God.

plead for you with the Almighty on the day of resurrection? who will save you from the fire, and give you admission into heaven by his mediation? Do you abandon the pilgrimage to the shrine of the Prophet Mahomed, (on whom be peace and blessing of God) through love of the world? To this he of the land replied, "No; I swear that I should prefer the pilgrimage to all things; I only require your permission to perform it this very year." "I have granted you permission," rejoined he of the sea; "but when you arrive at the shrine, submit my salutation. I have an offering to present. Enter with me into the ocean, so that I may take you to my city and admit you to my house—that I may entertain you and entrust to you my offering, in order that you may present it at the shrine of the holy Prophet, saying, This is an offering from Abdallah of the sea, who conveys his salutation, and intreats your intercession to save him from hell fire."

The story proceeds to state that the fears of Abdallah of the land having been removed by the assurances of his companion, and his body having been rubbed over with a certain ointment which gave him the power of living in the water, he entered the ocean with his marine friend. Then follows a long description of the wonders of the deep; Abdallah having seen "wedges of gold, great anchors, heaps of pearl, inestimable stones, unrivalled jewels—all scattered in the bottom of the sea"—and many other things undreamt of even by CLARENCE. The story concludes thus:—

Having taken leave of the king of the ocean loaded with jewels, Abdallah of the sea took his companion back towards his city. On the road he put into his hand a packet, saying, Take this, and present it as my offering at the shrine of the holy prophet. Abdallah of the land took charge of the packet without knowing what it contained. Abdallah of the sea then proceeded to convey him to the shore, but on the road there appeared an assembly of persons rejoicing and singing, and eating and making merry. Upon witnessing this, Abdallah of the land said to his companion, "For what are these people rejoicing? Is there a marriage among them?" His companion answered, "No—but some one among them has died." "What," said he of the land, "do you eat, drink, and make merry on the occasion of a death?" "To be sure we do," said the inhabitant of the sea: "do not you do the same on land?" "Not we indeed," said his companion; "on such occasions we cry and weep, and the women beat their faces and tear their clothes, and make all sorts of lamentation." On hearing these words, Abdallah of the sea exclaimed, "Deliver up my offering." This he did with fear, and having got upon dry land, Abdallah of the sea said, "I have parted with your friendship—you shall never see me again, nor shall I ever again behold you." "On what account is this?" asked his companion. "It seems then," replied Abdallah of the sea, "that you dwellers upon earth, whose life is a mere deposit by your Creator, cannot endure its being taken back, but you must weep thereat. What then would be the case with my deposit for the Prophet? When a child is born you rejoice that God Almighty has endued it with life as a deposit, but when that is taken away again you feel it as a grievance, and you cry, grieve, and lament. I have no occasion for such company." Saying this he vanished.

Abdallah of the land having put on his clothes and taken his jewels, proceeded to the king, who received him with much joy and gladness, and asked him how he was and what had befallen him. Abdallah then recounted his adventures, and mentioned all the wonders of the deep which he had seen. The king was astonished, but upon hearing what Abdallah of the land had said to him of the sea, the king observed that the former had erred in making the communication which he had done. For a long time afterwards Abdallah continued in the habit of going to the sea shore and calling upon his former companion, but he never re-appeared.

The king and his friend lived happily until the destroyer of delights—the spoiler of all things came, and they both died. Then praise be to God who never dies, who is the living God, Lord of kings and angels, and who has power over all things!

At the conclusion of the tale which immediately precedes the above, and which is styled "Histoire D'Aboukir et D'Aboussir," M. TREBUTIEN'S

version, is, " Aboussir le fit inhumé et lui eleva un monument sur lequel on grava une inscription *qui renfermait un sens très moral.*" In the Arabic MS. the inscription is given at full length. I here subjoin a translation of the Elegy, which is not without elegance in the original, but which seems rather intended to inculcate the advantage of prudence, and to convey the moral that " honesty is the best policy," than as a suitable epitaph on the tomb of the treacherous friend over whom it was erected. After a series of efforts to ruin his friend and benefactor, the treacherous man came to an untimely and ignominious end, while he whom he designed to ruin, and who buried his corpse (which was found tied up in a bag on the sea shore) attained the summit of prosperity.

" By his deeds a man is known among his equals.
" The qualities of a free-born and noble person resemble his origin.
" He does not revile, though he be reviled ;
" For how often what a man says recoils upon himself.
" Abstain from evil words and use them not, whether engaged in serious or trifling matters.
" How many a great man has been subjected to abuse,
" From one whose value is not equal to a fragment of his shoe !
" What is triumphant exultation ? even the lion is taken in the toil through ignorance.
" The sea bears on its surface the rotten carcass. But the pearl lies resplendent in its lowermost sands.
" I never saw a sparrow oppose a hawk, but I thought of its insignificance and want of understanding.
" It is written on a lofty pillar in Hindustan, Whoever cultivates virtue shall be recompensed in the like.
" Abstain from the attempt to make sugar of coloquintada ;
" For every thing must partake of the nature of its origin."

Scott, in the Preface to his translation of the Arabian Nights Entertainments, has observed, " The stanzas, elegies, and other poetical quotations which so frequently occur in the original, M. Galland has indeed omitted, but such omission (at least in the humble opinion of the Editor) is not to be regretted, for he thinks that to the European reader their insertion would have been an intolerable interruption to the narrative."

M. Trebutien does not seem to have been generally of this opinion, for he has on most occasions faithfully rendered the verse as well as the prose. Where he has not done so, the fault, I suspect, was in the original —not in the translation.

I have compared the MS. of Mr. Brownlow with the printed edition of Habicht and the lithographed work edited in Calcutta, as well as with Scott's and Galland's translations. The comparison was made with one of the old tales, and I took at random the first voyage of Sindbad the Sailor. This examination has afforded additional proof of the genuineness of Mr. Brownlow's MS. M. Habicht's edition comes next to it in fulness and accuracy. The Calcutta edition is very faulty and defective.

I cannot help thinking that an entire and correct translation into English of these beautiful stories is still a desideratum, and that no better original could probably be procured than that belonging to Mr. Brownlow. Scott's, which is the best translation, seems very inaccurate. Take for instance the following passage in the story of Sindbad the Sailor.

Reflecting on the time he had lost and the profligacy of his past life, he says that he called to mind the saying of Solomon, that three things are better than three things: " The day of death than the day of birth—a living dog than a dead lion—the grave than a palace."

This has been translated by Scott, " I remembered the saying of the great Solomon, which I had frequently heard from my father, that death is preferable to poverty."

I leave to other Members of the Committee the task of examining the first two volumes of the MSS.; if indeed any further examination be thought necessary to establish the genuineness of the work. I am quite satisfied as to that point, from the examination which I have made of the third and fourth volumes. The stories of Sindbad the Sailor are introduced at the commencement of the 3rd vol. of the MSS.; consequently it may be assumed that the "*Contes Inedits*" which I have not compared are to be found in the first and second volumes of the MSS. and a comparison of them with the Arabic might be still more satisfactory.

Upon the whole, I have no hesitation in stating my opinion, that the MS. copy of the *Alif Leila* now submitted to the Society is a most valuable addition to the literature of the East, and worthy of every encouragement. I have little doubt that the work would find a ready sale both in Asia and in Europe. I do not believe that Mr. BROWNLOW requires any pecuniary aid from us. As a Society, we might subscribe for a certain number of copies, and individually I should hope we shall not withhold our aid from this highly public-spirited and meritorious undertaking. To Government, I think, we should make an earnest appeal for support, founded on the credit which must accrue to our nation, from presenting to the Mussulman population of India, in a complete and correct form and in their own classical and beautiful language, these enchanting tales, which even in the estimation of Europe enjoy almost unrivalled celebrity.

Our Maulaví, if competent, might be desired to assist in correcting the press, and I for one should be very happy to aid in this duty, as far as my limited abilities and leisure might permit.

Sept. 20, 1836. W. H. MACNAGHTEN.

Minute by Mr. H. T. Prinsep.

I have examined the four volumes of the *Alif Laila* as far as my time would permit, and am able to confirm entirely the testimony given by Mr. MACNAGHTEN in favor of the accuracy and completeness of the copy. So far as my examination has gone, the tales and anecdotes given in the list at the commencement of the first volume of the "Contes Inedits" are all to be found in the Arabic, and those that have been translated are more full and complete in our copy than in the French version. I did not find the numbering of the nights exactly to correspond. Thus the anecdote of Zobeide in the bath is between the 382nd and 383rd nights, and the secret entrusted to the wife at the end of the 384th; whereas, according to the French list, these ought to have been found first in the 384—385th, and the other in the 387—388th night.

The French version of the "Contes Inedits" is not, it is to be observed, a very close translation; nor does it give in regular order the tales omitted by previous translators. It is still merely a selection, and made not exclusively with reference to merit or the interest of the tales. It is evident, however, that the original must have corresponded very closely with the copy brought to India, by Major MACAN, and was probably from the same. Whether it was as complete in all respects, and as carefully made, may well be doubted; for the getting up of this manuscript is of a very superior description. I do not find that the German edition in the original Arabic corresponds exactly in the arrangement of the tales with our copy, but the text does not materially differ of the same tales, which is an additional confirmation of the accuracy and genuineness of the very complete set of these tales now laid before us.

I join heartily in the wish expressed by Mr. MACNAGHTEN, that a complete edition of this work in the original Arabic may be printed in this country from Major MACAN's copy, and I doubt not that many subscribers

may be found to contribute towards the expense of carrying it through the press, if this should be deemed necessary. The offer of Mr. Macnaghten to correct the press with the aid of the Maulavís of the Persian office, is one that will be appreciated by all who wish well to the literature of the East, and it ought to determine those who hitherto have felt hesitation at the idea of attempting so great a work.

I am afraid that no capable person has leisure here in India to undertake the translation of these four volumes into English. But certainly it would tend equally to the credit of our literature were it possible to put this also in hand. Were I myself an idle man, I should like no better amusement than to take up such an occupation.

Sept. 25, 1836. H. T. Prinsep.

Minute by the Rev. Dr. Mill.

I entirely agree with Mr. Macnaghten and Mr. H. T. Prinsep as to the undoubted genuineness of Mr. Brownlow's MS. The style of these tales is very strongly impressed on the memory of every one who has read any large portion of them in the original: and on comparing the detached portions I have read from this MS. during the three days it has been with me, with the recollections of the Voyages of Sindbad which I have repeatedly perused from M. Langlès' edition (Paris, 12mo. 1814)—there is the same delightful ease and simplicity of style, with the total absence of the rhetorical effort so general in other works of imagination in the same language,—the same purity of Arabic idiom, with the free introduction of foreign nouns, which (even independently of the external evidence) bears witness to the common origin of all. This MS. is apparently much closer in its order and readings to Baron Von Hammer's Cairo MS. (bought at Constantinople) from which M. Trebutien's "Contes Inedits" are published, than to the Tunis MS. from which M. Habicht's complete edition of the original is now publishing at Breslau: and for this reason, amongst others, I do not think that work need preclude the publication of this.

e. g. the Persian *Sharábkhánah* and our own well known *Mosál-jée* (an Arabic participle with a Turkish termination) which I observe in Night 284, vol. 2, of this MS.

The part which I have taken almost at hazard for critical examination, is the part shortly preceding that which has been so ably examined by Mr. Macnaghten. It is the curious adventure (near the beginning of the 2nd volume) of Isaac of Mousul the musician, and the consequent introduction of the Khaliph Mámún to his future bride, the daughter of his Vizier Hasan ben Sehl. This occupies from the middle of Night 277 to 280 in the MS., but from 279 to 282 in Trebutien, (this slight difference arising rather from a different division than from any deficiency in this MS. as the collation of the preceding tales shews.) A comparison of this story with the same in Trebutien's third vol. (p. 289—295,) has convinced me that the text of Macan's and Hammer's MSS. is as nearly identical as those of any two ordinary MSS. of an oriental work, and that whatever discrepancies appear between the Arabic and the French in this part at least, arise from the translator rather than from his text. An example or two will best prove this.

MS. (literally translated.)

There appeared something hanging from the adjoining houses, and lo! a large basket decked with silk at the four handles. I said to myself, "Surely there is a cause for this," and I remained amazed at my adventure. But intoxication

Trebutien.

Je regardai ce que ce pouvait être, et, à ma grande surprise je vis une sorte de corbeille garnie de soie. Comme le vin que j'avais bu dans la soirée m'avait un peu troublé le cerveau, je me plaçai dans cette corbeille

so far transported me, that my mind said to me, "Sit down in it." Accordingly I sat down, and when those who let down the basket to me felt I was within, they drew it up to the top of the wall: and behold four damsels who said, "Alight freely and without restraint." And one of them walked before me with a taper till I entered into a house: and there were sitting rooms strewed out such as I had never seen even* in the Khaliph's palace.

sans savoir ce que je faisais, et au même instant je me sentis enlever en haut. Je fus reçu sur la terrasse par quatre belles esclaves qui m'engagèrent à descendre dans la maison. L'une d'elles marcha devant moi, un flambeau à la main, et me conduisit dans une salle, dont la magnificence ne pouvait être comparée qu'à celle des appartemens du palais du Khalife.

To the method so apparent in the above extract, of seizing only the points of the *narrative*, and neglecting the orientalisms of style and manner by which they are introduced, I should ascribe even the places where the two copies appear discordant; as, where in TREBUTIEN (after the long interview with the lady described in substance exactly as in the MS.) Isaac is made to go down by the basket as he came:—"On me descendit dans la corbeille;" whereas the Arabic MS. distinctly says in that place, "A damsel went down stairs with me and opened [the door] to me, and I went out and walked to my house." (Night 279): where it seems to me at least as probable that the translator hastening with the story after his manner, left out the circumstances of descent and added "dans la corbeille" afterwards, on revising his French, than that he found the basket in his original. The conclusion of the story furnishes another striking example of his manner, and of the disadvantage which these tales suffer by being so translated.

MS. (literally.)

Then we went out: and he said, "O, Ishak, do not tell this story to any one;" so I concealed it till the death of Mámún. Never had any one an interview such as I had during these four days, sitting in the day with Mámún and in the night conversing with Khadijá. By Allah I never saw any one of men like Mamún, and never did I behold a woman like Khadijá, who even approached her in wit and understanding and eloquence. But God knows best.

Trebutien.

Nous sortîmes de la maison, Le Khalife m' ordonna de ne pas parler de ce qui venait de se passer; et j'en ai gardé le secret jusqu'a sa mort. Ces trois nuits, dit Ishak de Mossoul, je les mettrai toujours au rang des plus agréables que j'aie jamais passées dans la plus aimable société.

Similar conclusions were obtained by comparing the preceding story in the 2nd volume of the MS.—the adventure of Abdallah the son of Abu-Kolába, and his discovery of the paradisiacal city of Sheddad the son of Ad—occupying from p. 284—289 of *Trebutien* (who calls him Abdallah, son of Kotaiba, and with whom his *nákah* or she-camel is a mule). The text of the two Egyptian MSS. of M. TREBUTIEN and Major MACAN must be almost entirely the same.

Very different, however, is the text of Professor HABICHT's edition, which, if it contains either of the above "Anecdotes" of M. TREBUTIEN, must place them in a very different place from that in which the numbers led me to search for them without success. And this is not wonderful, as the arrangement of the nights is altogether different in the two editions. For example, the Voyages of Sindbad in *both* the Egyptian MSS. (MS. vol. 3, and TREBUTIEN, Preface p. xlvi.) occupy night 536—565, but in the Tunis MS., Night 250—271, as appears in HABICHT's 3rd and 4th volumes.

* The discrepancy from the French may here very probably arise from the omission of the word ﻳﺪ by the copyist—but the mistake may just as probably lie on the other side.

On the other hand, the first of the unpublished Tales in both the Egyptian MSS.—where it occupies from Night 34—38 (MS. vol. 1 and Treb. p. xli.) occupies all from the 139th to the 218th in Habicht (iii. 66—166). It is not, however, actually longer in the latter than in the former: and as this tale, viz. the History of the two Viziers of Mohammed Ibin Soleman Alzíní [in Habicht "Alrasi"] has never been translated either by Galland or Trebutien, I selected it for the collation of the two Arabic texts. Here, though I found the printed and MS. text to tally in the main from beginning to end, not only as to the succession of incidents, but in the poetical passages interspersed throughout, the variations were very considerable both in the prose and the verse: whole clauses appeared in the one which were not in the other; the advantage of fullness being sometimes on the side of Mr. Brownlow's MS., but more frequently on that of the Breslau edition.

On the whole, I should strongly recommend the publication of this text without any reference to that of M. Habicht—even in the parts which might be compared with advantage. (Mr. Macnaghten's offer of assisting in the correction of the press is one which should be most thankfully embraced, however learned may be the Maulavi engaged for the purpose.) When *both* texts shall have been published, (belonging, as they do, apparently to two very different editions or recensions of these celebrated tales, one long current in Egypt and Arabia, the other among the Maghrebín Arabs of Barbary and Spain,) they may enable the critics of Europe to form perhaps a judgment as to the true original text of both. The work of a translator is one of greater difficulty: and we have none probably in India, possessed at the same time of ability and leisure for a work of this description. The ease and vivacity of M. Galland's translation, so deservedly popular among Western readers, would be a good model for imitation—avoiding, however, his liberties with his original, except, indeed, in the too frequent cases where decency requires curtailment or omission. M. Trebutien is far more faithful in giving the whole of his original: but in the mode of representing it, a due medium between his too occidental style of paraphrase, and a servilely literal version of the Arabic text, would be, in my opinion, at the same time more accurate and more pleasing.

W. H. Mill.

Minute by Mr. J. R. Colvin.

I have no pretensions to the name of an Arabic scholar, and shall not presume to offer any opinion of my own on the genuineness of these volumes. But I can bear testimony to the late Major Macan's opinion of their genuineness. He was a highly competent judge, and had made inquiries which satisfied him on the point before he bought the manuscripts in England.

I cordially join in the wish to give encouragement to the publication of a complete edition. J. R. Colvin.

Minute by Mr. C. E. Trevelyan.

Neither have I the least pretension to be called an Arabic scholar, but it is not necessary to be one in order to appreciate in some degree the beauty of the Arabian Nights. I think it very desirable that a correct version of the original Arabic should be published, and still more so that it should be well translated into English. Such a translation, if it were well executed, would be a most valuable accession to English literature, and I believe that for one person who would read the book in Arabic, five hundred would read it in English. Nobody, in my opinion, is so eminently qualified for this task as Mr. Macnaghten, and if he could be persuaded to undertake it, he would lay every person who reads English under an obligation to him. C. E. Trevelyan.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of September, 1836.

Day of the Month.	Observations at 10 A. M.							Calculated Humidity.			Observations at 4 P. M.							Calculated Humidity.			Register Thermometer Extremes.		Rain.	Wind.		Weather.	
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew point.	Hair Hygrometer.	Centesimal tens. of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	New Standard Barometer.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew-point.	Hair Hygrometer.	Centesimal tension of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	Cold on roof	Heat in sun.		10 A. M.	4 P. M.	Morning.	Evening.
1	29,549	29,603	85,7	5,0	4,2	78,3	91	79	80	80	29,407	29,471	88,9	7,3	5,6	77,0	88	71	69	74	76,0	108,0		S. E.	S. E.	cum. strat.	cloudy.
2	,516	,544	86,1	5,4	4,8	78,3	90	78	78	78											76,2	110,0	0,25	E.		cumuli.	
3	,518	,555	86,7	5,6	5,0	79,0	89	78	78	76	,400	,458	87,8	5,9	5,9	79,0	88	76	76	74	76,0	105,3		o.	se.	do	cum. fine.
4	,517	,560	86,1	5,8	5,0	78,0	89	76	77	76	,375	,431	87,7	6,2	5,0	77,5	90	72	72	78	76,5	104,0		ne.	n.	do	showery.
5	,470	,520	86,1	4,5	4,2		93	81		84	,405	,460	85,3	4,5	3,5	76,7	95	80	76	88	76,6	99,3	0,10	S. E.	S. E.	do	do. calm.
6	,579	,625	84,9	3,9	3,4	79,0	94	83	83	86	,477	,521	82,8	3,4	3,4	78,5	95	85	87	88	76,4	81,0	0,05	S. E.	S. E.	showery.	do
7	,632	,680	84,2	2,7	2,6	79,0	95	88	85	88	,535	,581	84,3	4,6	3,6	76,9	96	80	79	90	75,2	91,6	2,35	S. E.	S. E.	do	do
8	,677	,705	79,4	2,5	2,5	75,3	95	87	86	88	,595	,635	81,7	2,2	2,7	77,5	95	90	88	88	73,5	104,8	,90	W.	w.	overcast.	rain. all day.
9	,758	,798	83,5	4,1	3,0	79,0	93	82	87	84	,586	,696	85,1	4,5	3,7	77,0	92	81	85	82	76,7	88,8	,65	W.	S. W.	fine.	cloudy.
10	,759	,804	81,5	2,2	2,2	78,0	96	90	90	90	,592	,699	85,5	5,2	3,8	77,5	91	77	85	80	73,8	91,0	,10	S. W.	S. W.	contl. rain.	overcast.
11	,698	,727	83,6	4,4	3,2	77,0	94	81	89	86	,572	,625	88,2	7,0	5,8	77,5	88	70	71	74	77,1	103,0	,70	s. w.	sw.	cum. cirrus.	fine.
12	,711	,738	78,1	1,5	2,0	76,0	96	92	94	90	,600	,640	82,3	3,6	2,2	77,7	95	82	87	88	72,0	104,0	,40	o.	sw.	contl. rain.	showery.
13	,700	,742	85,3	5,6	4,5	75,0	89	75	72	76	,546	,657	90,3	12,6	12,0	72,8	76	53	53	52	74,2	107,8		o·	nw.	overcast.	fine.
14	,702	,738	85,0	9,2	8,0	71,2	82	58	65	62	,589	,638	89,1	13,4		69,2	74	50	53	49	76,2	109,5		N.	n.	clear.	clear.
15	,699	,738	85,3	8,0		71,4	84	63	64	66	,572	,620	90,9	13,5		72,4	73	49	56	47	75,0	115,0		N. W.	nw.	do	fine.
16	,655	,709	86,9	8,2	8,0	72,4	86	66	64	70	,547	,586	88,8	9,2	10,0	71,5	81	62	58	61	78,4	111,0		S. W.	W.	cum. strat.	dull.
17	,636	,696	87,2	7,6	7,3	73,0	85	66	64	68	,505	,581	91,9	14,0	11,7	71,4	73	36	52	47	77,0	122,0		nw.	nw.	overcast.	cumuli.
18	,626	,662	85,5	6,3	6,2	75,2	86	72	72	70	,520	,572	91,7	12,7	12,1	72,5	77	54	54	53	77,0	110,7		nw.	nw.	fine.	do
19	,646	,687	86,6	6,0	5,7	74,0	89	75	68	76	,536	,588	89,5	8,5	8,3	74,4	84	66	63	66	79,0	105,8		w.	sw.	do	do. fine.
20	,645	,689	87,3	5,6	5,4	75,2	90	76	68	78	,562	,605	84,9	4,9	4,3	75,0	92	78	73	82	80,0	95,0	1,50	se.	S. E.	cumuli.	overcast.
21	,674	,713	86,5	4,9	4,6	75,6		78	71		,553	,615	92,3	10,7	8,3	75,5		60	60		82,2	111,0		S. W.	S. W.	fine.	fine.
22	,708	,756	87,9	7,1	6,6	73,5		71	68		,590	,654	92,3	11,0	11,6	72,0		59	53		77,0	109,1		S. W.	S. E.	clear.	cir. cumuli.
23	,702	,751	88,3	6,0	6,6	75,0		76	66		,570	,630	93,2	11,0	11,2	72,8		60	52		77,2	115,8		N. W.	N.E.	cumuli.	cir. fine.
24	,631	,684	88,7	6,7	7,0			73			,479	,546	91,7	11,0	9,7	71,3		59	53		77,0	114,8	0,30	ne.	nw.	do. fine.	showery.
25	,601	,643	86,9	10,4	10,6	71,5		59	61		,506	,572	91,7	14,4	13,1	71,0		48	52		70,6	112,7		N.	N.	clear.	clear.
26	,654	,706	87,7	9,2	8,9	72,0		64	60		,593	,644	86,3	8,1	7,6	73,5		69	67		78,0	110,6		n.	N.	fine.	hazy.
27	,641	,698	88,1	7,8	7,4	73,5		69	63		,539	,606	89,8	11,1	5,5	75,3		59	63		74,5	95,2	1,50	N.	N. E.	cumuli.	hard. rain.
28	,631	,670	84,9	3,9	3,6	78,3		83	80		,519	,562	83,1	4,8	4,3	75,0		79	77		72,3	83,0	,60	N. E.	E.	hazy.	cloudy.
29	,527	,556	79,6	2,6	2,2	76,8		88	90		,405	,435	79,7	2,2	1,9	76,8		89	90		72,0	81,0	5,05	N. E.	N. E.	incessant rain	storm.
30	,565	,592	80,2	5,4	5,0			75			,486	,531	85,1	6,8	6,5	76,6		69	75		73,2	95,2		sw.	S. E.	cldy. gale.	nimbi.
Mean,	29,634	29,676	85,1	5,5	5,1	75,5		75,8	75,0		29,523	29,581	87,7	8,0	6,8	74,9		68,4	68,2		75,9	103,2	14,45	change.		close of rains.	

The new Barometer lower than the old .042 at 10 A. M. and .058 at 4 P. M. respectively. The hair hygrometer was applied to other experiments from the 21st for 'Calculated humidity.' See observations of last month.

Names of places in Dr Richardson's 3 tours in the Tenasserim provinces.

1 တနင်္သာရီ 2 ဒဝေယျ 3 လဝုန် 4 လက္ခုန် 5 ဆာရင်္ဂီ 6 သံလွင် 7 မုံပယ်
8 မုံနံ 9 အပေါ 10 ယိုတရား 11 မြနိမာ 12 လလိုင် 13 ဂျမေ 14 ဂမာလမြိုင်
15 ရင်ပိုင်း 16 မရခြောင်း 17 ရေတန္ဒုန် 18 ခြောင်ကကား 19 ဝင်ဗီး 20 ဂသာရင်း
21 ကြိုင်း 22 ဒါးကြိုင် 23 ဂသာရင်း 24 မှိုင်လုံကြီး 25 သံလွင် 26 မယိသာဝေါ
27 ဆင်ဖွယ် 28 မဲဂေါ 29 သစ်စည်း 29½ ဗျည်း 30 ဝေပွ 31 ဘနိတာ 32 ကာပါး
33 ဘုန်ကြီး 34 လဘုမ် 35 မဲဂကာနီ 36 မဲလိုင် 37 ဘွကိတဟေါင် 38 ဂသာရင်တင်
39 လဝ 40 ဂကာ 41 မဲဗိန် 42 43 44 မှိုင်ဝံတ် 45 မဲနံမ် 46 47 တဲ
48 49 ဂနောင်လုံ 50 51 52 မဲတာ 53 54 55 သံလျင် 56 ဂကာဟိ
57 58 59 60 မဲဌတ် 61 မတ္တမ 62 63 64 မှိုင်ကြင်
65 မဲကွန် 66 ကာနဲ 67 ဂကာင်မှု 68 မဲတီ 69 70 ဆင်ဖွယ် 71 မဲဆာဝေါ
72 ဂသာရင်း 73 ဝင်းတီ 74 ရေတန္ဒုန် 75 ရင်းပိုင် 76 ဒါးကြိုင် 77 မရမဂြိုင်
78 သိုင်ဖွယ် 79 ကျွဲဂခြောင်း 80 အုန်ဂချိ 81 လဝတလိုင် 82 ကြိုင် 83 ဆံပန်
84 အစုန်ဂခြောင်း 85 ဇမ္ဗသ 86 နောင်လုံ 87 ဂှံခေါင်းမြို 88 ယွန်ဂှလင်း 89 ရွှေ
ကျည် 90 တောင်ရှူ 91 ကွာတပြင် 92 ပါသင် 93 တဲ 94 စောဘွား 95 ရာဂှပလွင်
96 ကြိုင်းသင် 97 ကြိုင်းတုံ 98 မိန်းလသာင်း 99 ဂှရပ် 100 ဆရာတော် 101 ဗျသား
102 စံတပူရီ 103 ဘွန်ပြည် 104 ပျာသဒိပ် 105 106 ကရင်နီ
107 လက္ခုန် 108 ဗန်ဘုန် 109 ဗန်တိုဒ်ဒီ 110 ဒုံမိတလွှီ 111 ကြေးစည် 112 တီး
113 ဂမော် မယ် (The blanks are so in the original)

J.P. lithog.

Mr. Masson's Sketch of the sculpture at Bamián.
in the niche of the second Idol.



Coin found at Begram

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I.—*An account of some of the Petty States lying north of the Tenasserim*[1] *Provinces; drawn up from the Journals and Reports of* D. Richardson, *Esq., Surgeon to the Commissioner of the Tenasserim Provinces. By* E. A. Blundell, *Esq. Commissioner.*

[The small figures refer to the accompanying Plate, where the native words are correctly written in the Burman character.]

Of the numerous petty states north of the *Tenasserim* provinces, those only of *Zimmay*[2], *Labong*[3] and *Lagon*[4], on the east bank of the *Salween* and the slip of country on the west bank inhabited by a wild, barbarous, but independent tribe of mountaineers called Red Kayens[5], have hitherto been visited by Europeans. Of the vast extent of country between the *Salween*[6] and *Cambodia* rivers, we know little or nothing, though it is hoped the expected opening of an overland trade between the frontiers of *China* and the *Tenasserim* provinces will extend our knowledge of the intermediate country.

The town of *Zimmay* (or *Changmai*) is situated in Lat. 20 N. and Long. about 99 E. That of *Labong* is distant from *Zimmay* only 10 miles S. E.; *Lagon* about 50 S. E. from the same. The several states are named after these towns, but their respective boundaries are not well defined, and, together with those of *Moungpay*[7] and *Moung-nam*, appear to be the patrimony of one family. About fifty years ago, when the whole of this country was under the dominion of *Ava*[9], seven brothers succeeded, with the assistance of *Siam*[10], in throwing off the Burmese yoke, ejected them from the above named towns, and having been confirmed in the government of them by *Siam*, have continued tributary to that kingdom, and successfully resisted all the attempts of *Ava* to regain possession. The elder brother was invested with the title of Chow-tchee-Weet, or "Lord

of Life," with the supreme authority over the others, and the title has descended to each brother successively alive till it reached the youngest, whom Dr. Richardson found on his first and second visits, but who died at the advanced age of 73 years, during his third visit. It is now in abeyance in the family, and awaits the decision of the court of *Siam*.

Of the original inhabitants of this country but a very small portion now obtains,—perhaps not above one-third of the whole, owing to the great number that were carried off by the kings of *Ava* when they overran and subjected the country. The remainder consists chiefly of Burmese[11], Peguers[12] and Shans[13], from the different states tributary to *Ava;* either refugees or slaves; for slavery exists in this country in its worst features. The unfortunate wretches are kidnapped and seized by the hill tribes on the west bank of the *Salween*, of whom some account will be given, and eagerly purchased from them at very low rates, by the people of this country. Dr. Richardson was unable to form an opinion as to the amount of the population. He was told that the towns of *Zimmay*, *Lagon*, *Moung-pay* and *Moung-nam* contain each about 20,000 and *Labong* 14,000, but he thinks these numbers exaggerated.

In person the Shans bear a great resemblance to their Burmese and Siamese neighbours, though somewhat fairer. They are muscular, well formed, and healthy in their appearance: eyes moderately linear; nose small rather than flat; the mouth large, and disfigured by black teeth and gums, which they cherish as a beauty; the hair is long, straight, lank, and almost always black. They tatoo the lower limbs, but to less extent than the Burmese. Their dress consists of a cotton *putso* or cloth round the loins, generally blue, a blue cotton jacket reaching well over the hips, and a coarse red cotton turban; though many go uncovered. The dress of the chiefs is of the same description, but the materials are more costly,—Chinese crape or satin jackets, with gold or silver lace, the *putso* of silk. The women are fair and good-looking, and their dress more becoming than that of Burmese or Siamese,—not open in front as with the former, nor tucked up between the legs as with the latter. It is, however, fastened in the same way round the body without pin or string. Old and young have the bosoms bare, or but partially covered by a small scarf thrown round the shoulders. Many of the women are disfigured with goitre, but it seldom attains a large size. The people are a quiet, mild, good-humoured race, and not addicted to many vices. Opium smoking and gambling are scarcely known, and drunkenness is uncommon. The religion is that

of Buddh, and consequently their ceremonies and festivals differ in no material manner from those of the Burmese, which are now well known: indeed there is little other difference between the two races than that of dress and language; which latter is a dialect of the Siamese with a distinct alphabet, bearing in the formation of the letters a great resemblance to the Burmese character. Of the resources of a country so thinly populated and so constantly subjugated to the devastating inroads of both Siamese and Burmese, according as one or the other of these powers held the sovereignty, it is not practicable to form an estimate. Speaking of the soil and cultivation, Dr. Richardson says—"The soil in the low paddy and garden lands is a rich black loam apparently inexhaustible, in which the crops follow each other in uninterrupted succession. Cultivation is conducted with a good deal of care by irrigation and transplanting, and the return on good lands is about 120 and on inferior about 75 fold. The general seed-time is in July and August, and the harvest in December and January, though some descriptions of paddy are perfected in three months. Their plough closely resembles those used in the south of Scotland without the culture or ploughshare, and is often drawn by one buffalo. The principal articles of cultivation are the cauth-brier, or glutinous rice, cotton, maize, sugar-cane, tobacco, ground nut, chillies, several kinds of pulse, radishes, and turnips. Of grain, wheat, and other corn they have none. Pepper, cloves, and all the finer species of spices are unknown." Both the soil and climate seem well suited to the cultivation of Pernambuco cotton, which is now being introduced into the Tenasserim provinces; and it is much to be regretted that the seed with which Dr. Richardson was furnished on his last visit proved bad, as the people evinced great desire to cultivate so valuable an article. If the cultivation of South American cotton is found to answer in the Tenasserim provinces, of which great hopes are entertained, every exertion will be made to introduce it into the neighbouring countries.

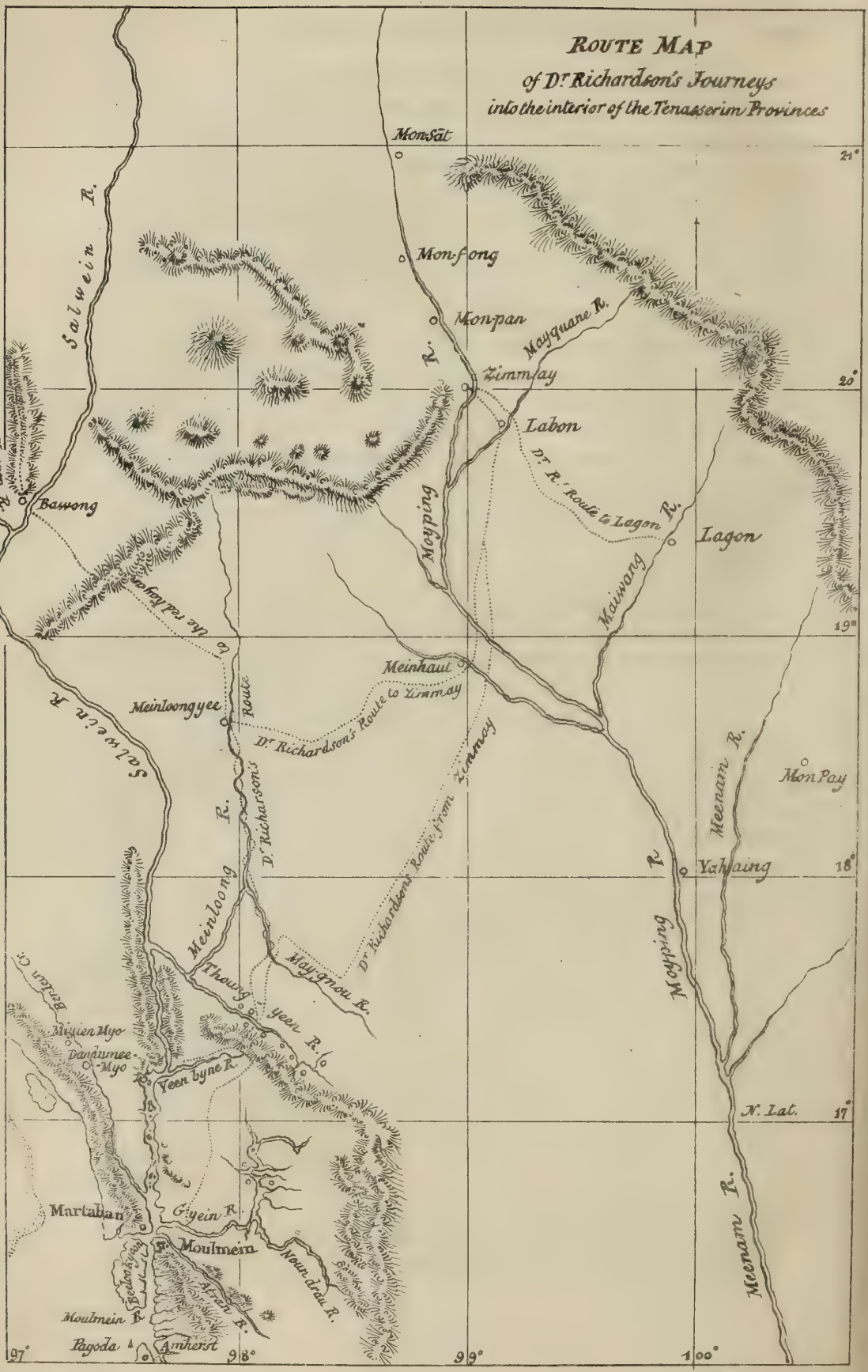
Tin, iron, and lead ores appear to be abundant in the country, and some of them very rich, though it does not appear that the extraction of the metal is engaged in to any extent. Dr. R. was informed that the tin ore yields 80 per cent., and some iron ore that was shown him seemed equally rich. There are extensive teak forests in that part of the country immediately adjoining our provinces, but owing to the difficulty of bringing the timber down the *Salween* river in consequence of rocks and rapids, it is doubtful whether we shall be enabled to avail ourselves of that supply to any extent. The country abounds in cattle, to procure which originally, and subsequently to

ensure the supply, has been the object of Dr. R.'s several visits. An immense saving has been effected to Government in obtaining from thence sufficient cattle for provisioning the European troops on the coast, in lieu of procuring them from either Bengal or Madras.

The trade of the country is unimportant. An annual caravan visits it from the frontier provinces of China, bringing silks, satins, velvet and woollens, (the latter chiefly English,) cooking vessels, musk, and trifling articles of Chinese manufacture; and carrying away chiefly raw cotton, the produce of the country. It is expected that a portion of this caravan will this year extend their journey to *Maulamyne*[14], and hopes are entertained that this will lead to annual visits in increasing numbers, and the opening of an important overland trade between China and our possessions on the Tenasserim coast. From *Maulamyne* are received British piece goods, chintzes, muslins, hardware, &c. in return for cattle, ivory, and a small quantity of stick-lack. With the hill tribe on the west bank of the *Salween* they exchange cattle, grain and betelnut (the latter from *Maulamyne* and *Bankok*), for slaves, tin, lead, and stick-lac.

It is evident from all that Dr. R. observed and reports, that both the chiefs and people of this country are not only desirous of continuing on the most friendly and intimate footing with us, but that they are really grateful for the immense benefit which our presence in their neighbourhood has conferred upon their country; and there is no doubt that should any future danger menace them, they would gladly place themselves under our protection, and see their country under our rule. Our occupation of the provinces has spread peace and happiness over a wide extent of country entirely independent of our authority, by putting an end to that ruthless and devastating system of warfare that had been for ages carried on between the Burmese and Siamese, whose object was not conquest, but solely to plunder and to carry off the defenceless people into irremediable slavery. On many occasions, as Dr. R. passed through the country, the common people and cultivators expressed to him how different was now their state to what it was in former years, when they scarce dared leave the walls of their towns to cultivate their lands; were obliged to be armed and constantly on the alert, and to leave their wives and families in the town; whereas now the country is in every respect equally secure, and they are enabled to follow their avocations without apprehensions of any kind.

The fact may be observed here, that our occupation of the Tenasserim provinces has also proved of incalculable benefit to a large portion of the population of Burmah themselves, as it is well known that the



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authorities in that country in our immediate neighbourhood,—Rangoon for instance,—have found themselves obliged to modify their exactions and oppressions, and to govern in a better spirit of justice and humanity, being well aware that the people have a refuge to fly to should they be driven to desperation.

The following extracts from Dr. RICHARDSON's Journal will show the route travelled by him, and give an account of his reception by the chiefs whom he visited.

Dr. R. left *Maulamyne* on 11th December, 1829, and proceeded in boats up the Salween river for about 100 miles, and landed on the 14th on the east bank at the junction of a small stream called the *Yembyne*[15]. From hence he started on the 16th.

Journal.

"16*th*. Direction North, 70 East. Time, 3 hours; distance, 7 miles, 4 furlongs.

"8. 30. Proceeded along a good path practicable for bullocks, elephants, &c.

"9. 35. At the bottom of a short and rather deep descent crossed the *Yembyne* river, about 70 feet broad, running South, 45 East.—11. 40. Halted for the night on the banks of a small grassy lake: the path has been good and gently ascending; the jungle of bamboos and common jungle trees, thick and impenetrable, owing to the creepers; the march, though only seven miles, was made with difficulty, owing to the thickness of the jungle.

"17*th*. Direction North, 80 East. Time, 3 hours; distance, 8 miles.

"7. 30. Proceeded for some way along a path of the same character as yesterday.

"8. 15. Along a swampy path at the foot of a nearly perpendicular rock, but covered with verdure to the top.—8. 35. Another rock like the former, (called by the Careens *Lein Koso;)* path better.—8. 45. Crossed a small stream with steep banks at the site of a village deserted last year by the Careens (who remove annually to a new position). It is now overgrown with tall jungle.

"9. 30. Crossed the *Yembyne* river, wide 30, deep 3 or four feet; clear, rocky bed, swarming with fish. Halt for an hour.—10, 30. Path soft, along a valley winding amongst the hills with long grass and dwarf bamboos, much intersected by tracks of elephants, rhinoceros, and wild hog.

"10. 10. Again crossed the *Yembyne* river, wide 40 feet; course South, 20 East.

"11. 30. Halted on the eastern bank (course S., 65 East), where it is joined by a small stream called the *Mean Keun*[16], running S. 50° west; the path nearly as yesterday; continued to ascend. Here we were joined by the Careens from the second villages, and dismissed those who accompanied us the last two marches.

"18*th*. Course North, 80 East; distance, 10 miles 4 furlongs.

"7. 30. Crossed the *Mean Keun* four times in 20 minutes, and proeeeded along a rocky path through thick jungle.—8. 20. Crossed *Yea-ta-goon Keun*[17] 20 feet wide; clear rocky bed.

"9. Came again to the banks of the *Yembyne* river.

"9. 10. Crossed a small stream falling into the last.

" 9. 30. Path soft through long grass surrounded by hills.

" 9. 40. Along the rocky bed of the *Yea-ta-goon-keun*, (waterfall stream.)

" 10. 30. Halted for half an hour.—11. Ascended with some difficulty the face of a broken rock 3 or 400 feet in height, over which the water of the *Yea-ta-goon* during the rains falls.—11. 30. Halted at the top of the waterfall, within sound of another which we heard tumbling from the hills above us to the eastward. The path to-day continued ascending and very bad, either soft with long grass, or rocky and uneven and extremely tortuous; but the Careens say it is the only pass through this part of the hills; that elephants, horses and bullocks formerly travelled it with loads, and that it was the route of the Burman army in 1790. Passed some of the large bamboos peculiar to this country, some catechu, and some of the tree with the sap of which the Careens poison their arrows. The rest of the jungle consisted of common jungle trees, immense creepers, and the common bamboos; tracks of elephants and wild hogs were numerous, but no marks of the rhinoceros, which is confined to the more level part of the country where grass is abundant.

" 19*th*. Direction North, 55 West. Time, 3 hours, 15 minutes; distance, 8 miles.

" 7. 30. Path along the stony bed of a stream.

" 7. 55. Skirt a ravine to the eastward.

" 8. 30. Crossed the *Keung Cank*[18], or crooked stream, eight or ten times running in various directions.

" 9. Path a little better, but repeatedly crossed by the *Keung Cank*.

" 9. 45. Halted on the banks of the *Ween Wee*[19], a small stream 15 or 20 feet wide, which falls into the *Thaung-Ein*[20] to the north-eastward. The path to-day was wet and bad; the jungle thick. No marks of inhabitants. Were joined in the evening by four Musulmans, who, together with seven who accompanied us, and five sepoys, make the party amount to forty-two persons. Those who joined us to-day came by the *Gyne*[21] road in nine days from *Maulamyne*, five by water to *Daggue*[22], and four by land. They represented the road as bad, and hilly, only accessible to people unincumbered, but inhabited by Careens, five or six of whose villages they had passed.

" 20*th*. Direction North, 35 East. Time, 2 hours; distance, 4 miles.

" 7. 30. Crossed the *Ween Wee*, and ascended a rather steep hill and proceeded along an ascending path, which appears as if cut along the face of the hill on the bank of a ravine 300 or 350 feet deep, but clothed with small trees and verdure, as are all the hills, even those which are nearly perpendicular.

" 8. Descending along a similar path through a jungle of the large bamboos; paths particularly good.

" 9. 45. Descended along the rather steep bed of a stream, water ancle deep; path extremely bad.—9. 55. Came to the bank of the *Thaing-Ein*[23] (called by the Shans *May-pmoie*) river, wide 160 or 180 feet; moved a short way down the western bank, north 20 east, in the direction of its course, and crossed over to the eastern side by assistance of a boat and some bamboo rafts. I had been led by the guide to believe that we should be met here by some chiefs of the *Zimmay* country with elephants, &c. to assist us in transporting the baggage and presents, and to accelerate our movements towards their capital; they had, however, decamped eight or nine days before our arrival, and we took pos-

session of their sheds, which were the first human habitations we had seen since leaving the boats. The *Thaing-Ein* river is the old boundary between the Burman and Siamese countries, and is now the British boundary in this direction with the latter nation. It arises in this range of hills about eight or ten days' march in a south-easterly direction from this, about one day's march from the course of the *Gyne* river, and falls into the *Mein-lun-ghee*[24] (called by the Shans *Mun-neum*) two days west from this. The united streams fall into the *Thaluru*[25] some distance above a cataract in the latter river, which entirely cuts off all water communication with the country above it, and in which even timber is shattered to pieces that happens to get into it.

"21*st*. Felt the first effects of being in the Siamese country, in being obliged to halt till the road was cleared by the Careens. There was an evident desire on the part of the Careens, who met us here, to detain us for a day or two: they indeed privately declared their orders from Chow Ho Kio, the chief who was to have met us here, to do so. I, however, intimated my intention to proceed on the following day. We were here furnished with a pig, rice, and fowls.

"22*nd*. Direction North, 20 East. Time, 2 hours, 30 minutes; distance, 6 miles, 2 furlongs.

"7 A. M. Proceeded along a good path through a patch of cultivated ground, where the Careens grow the hill rice, which is fine and small in the grain.

"7. 15. Ascended.—8. Crossed the *May-tha-woe*[26] river, wide 60 feet, clear stony bed; abundance of fish.—8. 45. Path along the side of a hill of the same character as last march. On the top of a steep rocky hill above the road is perched the first Careen village we saw. The houses are entirely composed of bamboos; the roof, with a very little slope, is made of two rows of split bamboos; the first row with the concave side up, and their edges touching the second, with the convex side up, and their edges in the trough of the first, embracing the two contiguous edges. There were only three houses in the village, the inhabitants of which, old and young, might amount to forty or fifty people; abundance of pigs, poultry, rice, &c. The people are dirty in their persons, and the skins of the men generally rough and scaly from exposure;—they were much alarmed at our first approach, but we gradually gained their confidence.

12. 30. Continued our march, and at 1 halted on the side of the *May-tha-woe* (which we frequently crossed in the course of to-day's march) in thick jungle, within sound of a heavy fall of water.

"23*rd*. Direction North, 20 West. Time, 2 hours, 30 minutes; distance, 5 miles, 6 furlongs.

"10 A. M. Having sent the coolies on three hours before, on account of the steepness of the hills: proceeded along a pretty good elephant path up the *steepest* hill we had yet ascended.—10. 45. A plantation of small seed cotton.

"11. 50. Reached the top of the ascent, from which we could count seven ridges of hills which we had crossed, running north, 20 east, to south, 20 west, but very irregular and broken in the descent.

"12. 5. Crossed the *Tsieu-dzoë*[27], (Elephant's tusk) rivulet, wide 15 or 20 feet.—12. 30. Halted on the banks of the stream at the foot of an extensive hill, covered with paddy stubble; the Careens say they reap 30 or 40 folds; and the rice is the finest I have ever seen, almost transparent, and when boiled beautifully white. The Careens of the hills have no cooking or eating apparatus;

the rice and a sort of vegetable stew are boiled in a joint of the bamboo, and the latter served up in another split in form of a trough, round which they squat with their rice on any leaf they can find large enough; there is one shell spoon in the stew which serves the whole party. This day's march was one of much labour to the coolies: many of them were seven hours on the road.

"24th. Direction North, 20 West. Time, 3 hours, 15 minutes; distance, 7 miles.

"7. 30. Proceeded along a worse path than usual, over a succession of hills, many of them covered with paddy to the tops, which would indicate a very considerable Careen population. The greater part of the hills this day were of primitive sandstone.—11. 10. Halted by a small stream at the foot of a hill.

"25th. Direction North, 60 East. Time, 4 hours; distance 9 miles.

"7. 30. Ascended a rather steep hill along a path much the same as we had travelled for the last few days.—9. 25. Marched along the bed of a stream about knee deep; the bottom rocky and broken, the water extremely cold, and the sun hot and beating on our heads till 11. 30, when we halted on the banks of the *Moy-Gnow*[28] river, (wide 150 or 160 feet) running to the northward and falling into the *Mein-lunghí* about one day above where the *Thaung-Ein* falls into the same river. No marks of cultivation throughout this day's march. Passed a number of teak and *thet-tse* trees: of the former there is an extensive forest on the eastern bank of the *Moy-Gnow*, but the falls of the *Thaluín* render it extremely difficult to transport it to the coast. The famous *thet-tse* varnish is merely the juice of the tree, which exudes from notches made in the bark into vessels placed to receive it, and is fit for use without further preparation. The tree has somewhat the appearance of the bastard teak. Saw also several small carroway trees in the jungle.—One o'clock. After a flourish of gongs in the jungle on the other side of the river, several Shans made their appearance, and a Burman of the party pushed over to our side of the river on a bamboo raft, and after ascertaining that I was not accompanied by an army, as had been reported by the Careens, communicated the fact to those on the other side: four petty chiefs, the heads of the party, then came over; they said they had been sent by the chief of *Zammay* to welcome me, and offered us their assistance for the rest of the march. They dispatched a letter to *Zammay* to announce our arrival, and begged us to remain one day on the present ground, assuring me that they had five elephants for my use. These elephants were a very seasonable relief, as the people were much knocked up, and the nature of the paths over steep hills or stony beds of small streams, had precluded the possibility of my riding for a single march.

"26*th*. Halted till some bamboo rafts were made to transport part of the baggage, which could not be carried on the elephants down the *Moy-Gnow*. I found that the chiefs who met me were part of the licensed robbers of *Labong*, and one of them (a Burman formerly captured in one of their predatory expeditions) was exceedingly anxious to excuse them for carrying off some of our people last year, as they were mistaken for Burmans. The Careens brought three pigs, some fowls, and rice, enough for the whole party: the Shans would not allow me to pay for them; hitherto every thing had been paid for that was brought to us.

"27*th*. Direction North, 30 West. Time, 5 hours, 30 minutes; distance, 15 miles.

"9. 30 A. M. Marched through a beautiful forest of teak and *thenghan* trees, on both banks of the river, which we crossed no less than nineteen times, occasionally following a path, more frequently without any, and the river in many places just fordable by the elephants; the whole of the baggage and most of the people were conveyed either on the elephants or on the bamboo rafts.—3 P. M. Halted on the east bank of the *Moy-Gnow*, having crossed one or two trifling hills in the course of the day, but the march was on the whole a slight descent, as we followed the course of the stream through the hills towards its mouth; the country was entirely uncultivated, and destitute of any sign of inhabitants. The wild elephants are much more scarce on this than on the western side of the *Moy-Gnow*, and even there much less numerous than on the British side of the *Thaung-Ein*. Tigers, deer, wild cows, &c. &c. are, however, numerous here. The Shans march without tents or coverings of any desoription, and make little huts of branches after each march in the same manner as the Burmese.

"28*th*. Direction North, 30 West. Time, 4 hours, 15 minutes; distance, 12 miles.

"11 A. M. Crossed the river ten times, and proceeded along the banks through a country of the same character as yesterday, with scarcely a sign of a path, and learned that this road is never travelled except by the chiefs when collecting the tribute from the Careens, who, in the neighbourhood, are tributary to *Ponya*[29] or *Benya-tche*, the principal of the four little chiefs who came to meet me.—3. 15. Halted on the east bank of the river, about the same width as when we first came on its bank.

"29*th*. Direction North, 25 West. Time, 2 hours; distance, 6 miles.

"9 A. M. Continued our march along the banks of the *Moy-Gnow* till about 10 A. M. when we left it to the westward, and, crossing a rather steep hill, came at 11 o'clock on the banks of the *Mein-lun-ghee* (running to the southward; wide about 120 feet) a short way above where it is joined by the *Moy-Gnow*.—11 A. M. Crossed and halted. Saw numerous marks of elephants, deer, elk, and hog, in a soft part of the jungle to-day: the Shans say that they all eat that sort of mud, a kind of black stiff (probably saline) loam or rather clay;—killed a small animal to-day called by the Burmans *Poe*[30], and of which I do not recollect to have seen any description. The head is large and round, like an otter; the cutting teeth like a rat, and feet slightly webbed, somewhat resembling in appearance, though inferior in strength, to the moles. The fur exactly like that animal, but larger in the staple, and, I think, even finer—it is little larger than a common English mole, and burrows with great rapidity. There are two kinds of the same animal; the other differs in being much larger, and the hair coarse and harsh, like the bandicoot. I regret that the specimens I obtained were both lost.

"30*th*. Direction North, 30 West. Time, 4 hours; distance, 12 miles.

"10. 20. Continued to march along the *Mein-lun-ghee* in the same way as we had done along the *Moy-Gnow*. Crossed twelve times to-day. Its average breadth 130 or 140 feet, and depth about six feet. Its course continues amongst the hills, which are covered with teak and *that-tse* trees, as those of the *Moy-Gnow*.—At 2. 20 halted on the western bank of the river in a small patch of paddy in a plain of few miles extent; the first lowland paddy we have seen since leaving the *Thalween*, and the first of any cultivation since joined by the Shans.

"31*st*. Direction North, 20 West. Time, 4 hours, 10 minutes; distance, 12 miles.

"8. 15. Marched to-day along a path better than any we have seen since crossing the *Moy-Gnow*.

"11. Passed the village of *Bowtaa*[31]; 12 or 14 houses surrounded by a small patch of cultivation. Having crossed the *Mein-lung-hee* river four times to-day.—12. 25. Halted in a rather extensive patch of paddy stubble belonging to the village *Kapa*[32], which is distant a mile and a half. Nearly the whole of the country between this and the village, which is in a small valley, has last year been under cultivation; all the rice in the country is of that glutinous description called by the Burmans *kanghuyeen*; the only hard rice that can be obtained is from the Careens, who left us to-day, and by whom we have been accompanied from the neighbourhood of one village to that of another since leaving the *Thalween*. They are a fair, well-limbed, athletic race, superior in appearance generally to the Talines and Burmans, but have been oppressed from time immemorial by Talines, Burmans, and Shans, whoever happened to have the ascendance. They have been obliged to furnish provisions, erect huts, cut the jungle from the edges of the path, and furnish guides to all travellers crossing the hills, the latter of which services they performed for us, and were much surprized at being paid for whatever they furnished us. They annually shift their habitation, and if they pitch upon a site near a path, it is immediately shut up. In addition to the other inhabitants of the jungle, we to-day saw marks of rabbits in considerable number.

"*January* 1*st*. Direction North, 20 West. Time, 4 hours, 50 minutes; distance, 14 miles.

"9. 45. Proceeded along a good path through the paddy grounds of the village of *Kapa*, which we passed at 10. 20, consisting of about thirty or forty houses precisely in the Burman style, with one or two *Pungee*[33] houses, but no pagodas, &c.—11. 25. Passed the first pagoda we have seen since leaving *Thalween*, perfectly dilapidated. Near a small village saw 70 or 100 heads of good cattle in a rather extensive paddy field.—2. 35. After traversing a grassy plain intersected with belts of jungle, halted on the south bank of a small stream running to the westward and falling into the *Mein-lung-hee* river about quarter of a mile from the village of *Mein-lung-hee*. The path to-day was well marked, and there was more appearances of cultivation than we had before seen. We only crossed the *Mein-lung-hee* river three times. The rise of water in the rains, from the marks on the trees and banks in this river, cannot be less than 30 or 40 feet.

"The Shans being anxious to detain me on the road till an answer is received to the letter notifying my arrival, dispatched on the day I met them, I have consented, as I cannot well proceed without their assistance, to remain here two days."

The town, or rather village, of *Mein-lung-hee* at which Dr. R. arrived this day, is a collection of huts about 200 in number, scattered over an extensive plain of $3\frac{1}{2}$ or four miles in width, through which the river of the same name runs, having its rise about fifteen or twenty days' journey north, and pursuing a southerly course nearly parallel to the *Salween* till joined by the *Thoung-yeen*, when the united streams take a westerly course and enter the *Salween*. The town is under the jurisdiction of *Labong*[34], from whence a governor is appointed,

who levies contributions from the Kayen tribes in the neighbourhood, and is not scrupulous of occasionally extending his exactions into our portion of the country. Such is the wild life and timorous nature of these tribes that they submit to any one who appears invested with any authority, and it is difficult to induce them to visit *Maulamyne* with their complaints. *Mein-lun-ghee* being the first frontier station, is generally passed through by the traders of *Maulamyne*, and the Shan States also by those of the latter, who visit the country of the Red Kayens to purchase slaves. An effort was made to detain Dr. R. here, till an answer should be received from *Labong* regarding him; but on evincing a determination either to proceed or to return immediately to *Maulamyne*, elephants were furnished him, and he resumed his route on the 6th.

"*6th.* Direction South, 80 East. Time, 3 hours, 30 minutes; distance, 10 miles.

Six elephants were produced, and at 10. 20 we proceeded across the valley to the south-eastward.—11. 12. Commenced the ascent of the eastern hills, which is gradual but considerable.

"1. 15. Crossed the *Moy-Konie*[35] within quarter of a mile of a fall 60 or 80 feet to the S. W. of the road.

"1. 50. Halted on the banks of the *Moy-Konie*. Three of the elephants had four young; all born in captivity, which the Shans speak of as a thing of course: one of them had two, one about six years old, the other about 2½ or 3, still sucking. We here left all the little chiefs, but BENYA-CHI and the Burman who was taken prisoner twenty-five years ago. The road to-day (one of the principal routes to the *Careen Uee* (or Red Careens) country) was good, and the hills not very steep.

"*7th.* Direction South, 80 East. Time, 7 hours, 50 minutes; distance, 14 miles.

"8. 55. Steep ascent for two hours; great part of the way in ruts as deep as the elephants' backs worn by the mountain torrents.

"11. The mist on the hills and valley below us with a beautiful clear sun on it, had exactly the appearance of snow. A cold piercing wind from the eastward.—11. 15. Narrow road along the side of a hill which rises perhaps 150 or 160 feet above it, with a deep ravine below to the eastward.—12. Continued cold and chilly; left the elephant; steep descent for nearly an hour.—2. 45. Halted on the banks of the *May-lie*[36] (which falls into the *Mein-lun-ghee* about a day below the village) on a beautiful little plain surrounded by high hills, and bounded on the south-west by the stream 10 or 12 feet wide.

"The march to-day was almost a continued ascent; some of the hills very steep; the elephants frequently obliged to stop from fatigue; the paths tolerably good, evidently much frequented, and said to be cut by a Shan king[37] of great power, but evidently the tracts of elephants deepened by the torrents, in many places as deep as the backs of the elephants, not more than 18 inches wide at the bottom, and just clear of the howdahs at the top. The elephant from which I dismounted at 12 did not come to the ground till 4. 45, and was consequently

8 hours, 50 minutes on the road; some of them did not arrive till an hour afterwards from the difficulty of the ascent.

"8*th*. Direction North, 70 East. Time, 5 hours; distance, 12 miles.

"9. Continued to ascend the hills in a path rather better than that of yesterday; free from ruts.—10. 45. A good broad road along the side of the hills for an hour or two.—2. Halted on a small plain near the *Lowa* village of *Meing-lay-been*[38] containing five or six houses. The nights have gradually been becoming cooler as we ascended, and there are seven of the people ill with fever in consequence. The thermometer stood at 46° in the tent this morning at 8 A. M.

"The jungle plantain, thet-tse, bamboos, and pine in luxuriance, the latter forming the principal part of the jungle (or forest, for it has lost much of its density in these upland regions;) the creepers have almost disappeared, and the trees which form the crest of the hills to the westward may almost be counted in the afternoon, and might be traversed with little difficulty.—At 11. 15 to-day from the top of one of the high hills nothing could be seen as far as the eye could range but masses of hills rising one above another, covered with the same description of jungle to their summits, but no snow to be seen; if they can be said to be disposed at all into ranges, it is between S. S. E. and N. N. W. but they are extremely irregular and broken.

"9*th*. Direction North, 45 East. Time, 6 hours; distance, 10 miles.

"8. 55. Continued to ascend.—2. 30. Open forest, composed entirely of fir trees, tall, straight, and free from branches, to the height probably of 50 feet.

"2. 55. Halted at the *Lowa*[39] village of *Bo*[40], situated in an open plain in the forest, perhaps of 12 or 15 miles in length by five or six in breadth, as has been the case ever since leaving the *Mein-lun-ghee*. Our march has been a continued ascent, but gradually surmounting hills in succession, with several descents throughout; we are now said to occupy the highest and coldest halting place on the road; the fir has been the most numerous tree throughout the march, and the only one during the latter part of the day. The village of *Bo* consists of 60 or 80 houses: the people are all ironsmiths, and are exempted from all service but furnishing elephants' chains, cooking pots, spears, and other iron-ware to the Shans during war, or for military purposes; the iron ore is a red oxyd, and is found in immense masses in a hill to the north-westward less than one day's journey. It is brought to the village on elephants and melted in a simple furnace—yields nearly 50 per cent. of metal, soft and unfit for knives, ploughs, shears, &c. &c.; they have not the art of hardening it. The people are said to be rich, particularly in elephants, of which there are not less than sixty or seventy in the village.

"10*th*. Direction South, 65 East. Time, 5 hours, 40 minutes; distance, 14 miles.

"10 A. M. Ascended by a good path, much frequented throughout.—10. 20, descent.—1. 25. Saw the *May-ping*[41] river, which falls into the sea at *Bankok*.—2. 20. Rocky steep, difficult descent.—3. 15. Crossed the *May-papie*[42] river, knee deep, running easterly.—3. 40. Halted on the banks of the *May-papie* on a small grassy plain. Since 12. 20 we have been descending; the road though rocky has been pretty good, the air is decidedly milder, the pine has been gradually diminishing in numbers, and now not one is to be seen; the jungle just here is very close; the rocks throughout the latter part of the march old gray

sandstone, previous to which they have been granite with a large portion of felspar.

"11*th*. Direction North, 80 East. Time, 4 hours; distance, 12 miles.

"8. 40. Crossed the *May-papie*: good path and less precipitous.—11. 50. Crossed a small dry rivulet in which rubies of small value are found.—12. 5. Crossed the *May-Haut*[43] about knee deep, by which the paddy between this and the village is irrigated; nearly all the paddy in the plains of the valley of *May-ping* is cultivated in the same way.—12. 30. Halted at the village of *Maing-Haut*[44] (pronounced by the Burmans *Mein-Woot)* on the west bank of the *May-ping*, which runs to the southward and falls into the sea at *Bankok* after joining the *May-nam*[45].

"The march to-day continued to descend gradually, with a few trifling acclivities till 12; since which nearly level; the climate proportionately improved; the jungle has assumed the same character as on the other side of the hills, but more open.

"We are now fairly in the valley of the *May-ping*, and have the prospect for the next three or four days of seeing something of the level country, but the whole extent of the country between the *Thalween* and *May-ping*, with trifling exceptions (such as the little valley of the *Mein-lun-ghee*), is one succession of mountains; nearly all of the primitive series, principally gravel gneiss trap, lime and sandstone.

"We crossed the *May-papie* thirteen times to-day. The village *Maun-Haut* contains about sixteen houses of the most uncomfortable appearance; it is about 12 days from *Bankok*, with which the communication is frequent; the river here is about 200 yards across, and rather rapid; there are a number of palmyra, cocoanut and other fruit trees, both here and on the opposite side, where there is also a small village.

"The river here is a little wider than above or below the village, and just fordable by elephants; there are few fish in the river, and the people almost ignorant of the art of catching them. On endeavouring to procure boats as the easiest conveyance for the sick, I was not a little surprised when only one small canoe could be procured, in which only one of the worst cases could be sent forward.

"Remained here one day at the request of the persons who accompany me, in order to transmit intelligence to *Labong* of our approach.

"13*th*. Direction North, 20 East. Time, 5 hours; distance, 15 miles.

"9. 15. Road lies along the foot of the western hill; the river turns towards the eastern hills, which are distant about 20 miles.—11. 55. Crossed the *Nam-May-tcheem*[46], wide 100 yards; fordable by elephants.—1. 45. River 200 yards wide; full of shoals.—2. 5. Crossed the *May-ping*, and halted on its eastern bank in an open jungle, where a house[47] had been built for our reception. The road to-day has been nearly level and much frequented; the whole of the valley was inundated last year to a greater extent than is recollected by the oldest people, the paddy being nearly all destroyed, and the people obliged to take to the hills.

"14*th*. Direction North, 30 East. Time, 5 hours, 15 minutes; distance, 16 miles.

"8. 15. Road good level.—9. 55. Grassy plains.—1. 30. Crossed the *May-lie*[48], which falls in the *May-ping* four miles to the westward, wide about thirty or forty yards; halted on the eastern bank at the village of *Naung-long*[49].

"15*th*. Direction North, 60 East. Time, 7 hours; distance, 21 miles.

"8. 5. Road good, passable for bandies.—12. 20. Grassy plains intersected with jungle.—1. Western hills distant 20 miles; eastern hills, 4 miles; hills n sight to the northward.—1. 30. Paddy ground; numbers of buffaloes and black cattle.—2. 10. Halted between the village of *Bansan-kanoy*[50] and *Ban-soupta*[51] on the western bank of the *May-ta*[52], a small stream, which falls into the *May-quang*[53] about a quarter of a mile from this, and from thence into the *May-ping* a quarter of a mile further to the south-west.

"The road to-day has been very good, much frequented and passable for a bullock cart; throughout marks of recent inundation are still very visible; oranges, pummaloes, pine apple, mangoe, palmyra, cocoanut, guavas, and other fruits are abundant; the first and the cocoanut are the only two now in season. The people have much improved in appearance; some of the women and children are nearly as fair as Europeans: many of the latter with light hair; the eyes are large and expressive, not at all like the Chinese; the nose, however, is small, like the Burman.

"They have had a report current here for the last month, that the English were coming up with 1,000 men, which has alarmed them a good deal. A letter has been dispatched to the people here to-day, telling them who I am, and ordering them to supply me with every thing I want; and the messenger begged I would remain here two or three days, till the road was made smooth and every thing ready for my reception at the capital. There is no way of avoiding their ridiculous delays."

Dr. R. was delayed here a few days, on the plea of preparing for his reception, and ascertaining from the astrologers a lucky day for his visit.

"20*th*. Direction North, 20 East. Time, 2 hours, 10 minutes; distance, 6 miles.

"10. 20. Started on horseback with ten or twelve elephants, each having a little either of my baggage or presents. At 11. 35 I was met by the second son-in-law of the *Tsoboa*, the 3rd chief of the province, with fifty elephants. On each were mounted some of the numerous relations of the chiefs. They had brought a spare elephant for me, on which after complimentary speeches of welcome, I mounted, and we continued our march; the elephant on which I rode being last. In this procession we proceeded slowly towards the town, occasionally stopping to let the elephants pull the pine apple plants and plantain trees out of the gardens of the poor people, with whom the chiefs chatted on the most familiar terms.

"At 12. 30 we arrived at this spot, about a mile from the town, which they had fixed on for my encampment. My tent was already pitched in a little square of sheds, which they had built for the people. The chiefs remained with me about an hour, examined the muskets, talked of our soldiers, &c., and then took their leave. On inquiry I found there were two chiefs from *Lagon*, but none from *Zimmay* present. There is only a small portion of the walls of the fort visible from this, and none of the houses; and from the immense number of cocoanut and betelnut trees growing inside, it has more the appearance of a forest than a fort; the tops of two pagodas (one of which is gilt) are

visible over the tops of the trees ; the whole country is so covered with wood that not twenty houses are to be seen from this place : there are as many round the Fort as there are in it. It stands on the right bank of the *May-quang*[54], which is here about 30 feet wide and three deep at this season, though navigable for boats of some burthen during the rise of the river. The *May-quany* falls into the *May-ping* about half a mile from this (in the valley of which river both this town and *Zimmay* are situated), which pursues its course amongst the hills from this to within a few days of *Bankok*, where the hills terminate, and the country spreads into a plain populous and fertile. The valley varies in breadth from 10 or 12 miles to 60 or 80 ; the soil is a rich sandy loam, and from the beds of the river apparently of great depth ; the hills are of very considerable height, but no snow is visible from this, though the thermometer at 7 o'clock is seldom above 53°. The distance from this to the frontier towns of *China* is about 40 elephant marches (probably of 12 or 15 miles each) over the northern hills, and throughout that distance no snow is said to be encountered ; but to what other cause than snow the rise of the river can be attributed, I am ignorant ; as it is thought a heavy monsoon if there are three or four days of heavy rain in a month. The annual rise of the river is considerable, and last year was so excessive as to drive the whole population from its bank.

" I have had no communication with any of the chiefs to-day, but a letter was sent to the person (a Benya) left here to provide any thing I might want, to keep the Pungees and the people from crowding round my tent, in consequence of a representation of mine yesterday. The bearer of the letter said it was the wish of the chief that I should be presented to-morrow, and begged that I would not bring any pocket pistols or any other hidden instrument of death ; I requested to know if I should wear any sword, as it was looked on by us as a mark of respect ; to which they also objected. The materials have this evening been brought to build me a small house.

" 21*st*. At 12. 30 sixteen coolies with seven large silver, and nine copper calats (salvers), and a body of peons armed with spears, came out to carry the presents and conduct me to the presence of the chief.

" The walls of the fort are formed of the red ferruginous porous stone common in Burmah at the bottom and the top of bricks of the most slender construction ; the sides of the streets for a few yards were lined with the common people, bearing muskets ; the shed (about quarter of a mile from the gate) in which the chief received me, was about 60 feet long and 20 wide, with three sheds at right angles built for the occasion, occupying the whole of the front, all of which were filled with people ; many of them near relations of the chief, and all in the crouching position common with the Burmans ; nearly all armed either with swords or muskets. The presents had already arrived, and were placed at the upper end of the centre shed. Having made a bow to the chief, I went immediately up to his seat (a small light chair) and presented the letter. I said that I was fortunate in being the first to open the road of friendship between the two countries, that it was the wish of the English Government that the merchants of each should be as uncontrolled in the territories of his neighbour as if they were in their own, &c. &c. He answered, he had long turned the eyes of friendship towards us ; that he was happy the gold and silver road had been opened ; that he hoped we should now be as one people, but that the presents must be

sent to the king of Siam, whose instructions would be taken. He wished to know what terms we were on with the Burmese. I said on terms of friendship: that after a war of two years they had sued for peace, and had obtained it—that they had nearly fulfilled the terms of the treaty, and that it was a principle of the English to forget an injury as soon as reparation was made. He said such was not the case with them; that they had been at war with the Burmans for ages, and that they killed or made slaves of them whenever they had it in their power—that the Burmans were equally inveterate. He then asked if I thought I could obtain an order from the Commissioner of *Maulamyne* for the Burmese to give up some tribes of Shans who had originally formed part of their kingdom of *Siam*. I said they were Burman subjects; and though we had conquered the greater part of their kingdom, it had been restored to them, and that we had now no control over them. He said that we had the *Thenieu*[55] or *Siriam* Shans with us; that they were originally from *Caung-Ghan*[56]; and that if they wished to return to the land of their forefathers, he hoped that they would not be prevented. I said, that *they* were our subjects, and that if they wished to return, every facility for doing so would be afforded them.

"I thought this too favorable an opportunity to be missed, as I knew nearly every one in court was aware of my being acquainted with the circumstance of thirty or forty families of Burmans having been carried off by his people when coming to *Maulamyne* with a pass from Sir A. Campbell. Seeing the person who carried them off in court; and a Mussulman merchant being with me who had represented the impropriety of their proceedings at the time, and fearing that an unfavorable construction might be put on my silence and a precedent for like enormities in future; knowing also that Major Burney had demanded and obtained from the court of *Siam* the liberation of several hundred people carried off by the Siamese from about *Mergui* and *Tenasserim*; I thought it my imperative duty, as the business had already in some degree been agitated, to endeavour to obtain their release, notwithstanding my instructions were not to interfere in the matter if it could be avoided. I therefore said, I hoped equal indulgence would be granted to the *Taline* people who had been taken with the British General's pass. He denied having seen the pass, though I believed at the time and have since heard that it was shewn him when several of the *Zimmay* and *Logan* chiefs were present—that their liberation was agitated and opposed by the *Zimmay* chiefs. The chief who carried them off being in court, and having been before pointed out to me, I immediately put it to him, and he acknowledged that the pass was still with him, but no one present understood English; that they were ignorant of its contents, but it should be brought to my tent in the evening. Chow-tche-Weet said it should be made known at *Siam*, and that they must abide by the instructions from thence. I mentioned the circumstance of Major Burney's mission, and said I was sure it only required to be made known to his Siamese Majesty. The old chief was evidently much embarrassed during this part of the conversation; however, in case of any thing further being done towards their liberation, he cannot again plead ignorance. I repeated the hope that our intercourse might be free and unrestrained, and was again told that they must wait for instructions from *Siam*. I said that they might come to our settlement on the coast with the same freedom they would go to *Lagon* or *Zimmay*, and requested that Ponya-tche (who had

asked me to make the request) might be allowed to accompany me to *Maulamyne*, where he would see the facility with which business was carried on amongst us, and the advantage to both countries which would arise from an unrestrained trade. He said he was about to send him to *Bankok* with the presents I had brought in the course of next month. I hoped he would find it convenient to send some one else, and from the great number of chiefs I there saw round the hall, I thought it could easily be managed. I then took my leave, and in the evening PONYA-TCHE called on me, expressed himself much disappointed, and begged I would not give up the point. He was persuaded if I repeated the request he should be allowed to accompany me, and as he is one of the most intelligent persons I have met here, and the ultimate object of the Mission likely to be forwarded by his accompanying me, I promised I would do so. I asked him if there was any objection to my riding through the fort, &c. &c. He told me CHOW-TCHE-WEET had desired him to tell me I was at liberty to go where I pleased in the day, but that the gates of the fort were shut at night, and that it was rather expected I should call on some of the lesser chiefs, his numerous relations. I proposed calling to-morrow on his son-in-law, and one or two others of the chiefs who met me on the road and remained here the day I arrived."

The following are extracts from Dr. R.'s journal during his residence here, which are the most likely to interest the general reader.

"They had no idea that any European would attempt to cross the hills. I visited CHOW HOUA[57]*; he is an intelligent man, about 40, of quiet and agreeable manners, to whom the chief government of the province is entrusted. The whole conversation was of the war with the Burmans, their hatred to whom is only exceeded by their dread, and their expressions of friendship for us proportioned to their idea of our power from having conquered the Burmese. The *Zimmay* chief who is nephew to CHOU-TCHE-WEET is by no means so friendly to us as the others, and there is some sparring between them now, about my being allowed to come here. On my return in the evening I found CHOW-NI-MOI-KOIN at my house with two of the first chief's wives and several musicians, waiting to entertain me with a nátch and singing; the music was particularly pleasing. One man, a northern Shan, sang remarkably well, both as to taste and execution, much in the style of the Chinese, but much superior to any thing I ever heard in that country. I presented a cotton handkerchief and a Madras rupee to each, with which they were highly pleased.

"*24th.* Rode round the fort to-day, which is of an irregular form; the largest end towards the south. The east, west, and southern faces are nearly of the same length (probably 15 or 1600 feet); the north end not more than 1,000. The wall is from 15 to 23 feet high outside, and from 13 to 18 inside, and of the most flimsy possible structure, with four gates in the east and two in the south, two on the west, and one in the north face, surrounded on three sides by a wet ditch of 60 or 70 feet wide and in good repair. On the east side the river flows: at this season it is not more than knee-deep; at the gates are guards of half a dozen coolies without arms. On the eastern bank of the river opposite the fort are the remains of an old stockade of equal size with the fort, with brick angles and bastions. The houses are more numerous without than within the fort. On the western side is an extensive plain of rich

* The title of the heir-apparent to the chieftainship.

paddy ground as far as the eye can reach from north to south, and five or six miles from east to west covered at this season with many thousand head of cattle, buffalos, also elephants in considerable numbers. Saw some of their bandies, which are the best specimen of their workmanship I have seen; the wheels are exactly like, and equal to those of a common English cart.

"25*th*. I have heard to-day that orders have been given to the people not to buy any thing from the merchants who accompanied me, and not to come about my house. Yesterday they endeavoured to exchange their goods for cattle, but the people dare not sell without orders, though anxious to do so. I sent the interpreter to Chow-tche-Weet, as is the custom here, to intimate my intention of calling on him. He excused himself on account of indisposition. I told the interpreter also to say I was anxious to return on Saturday or Sunday at farthest, and to inquire if there were any objection to my going to *Zimmay*, to which I received no answer.

"Called on Chow Rajawoon, an elder brother of Chow-tche-Weet's, but by a concubine; he lives in a small bamboo house outside the fort, but has gold betel apparatus, the gift of the King of Siam, which is only given to chiefs of rank. He has twenty-eight wives, and told me with evident exultation that they were all taken prisoners by himself but one. He was chief of the Dummyas, or licensed robbers, for many years,—a situation of some honor and danger, where the most barbarous system of border warfare is carried on with the most rancorous hatred, and where the State looks upon the prisoners taken by these treacherous midnight robbers as a principal source of its population.

"I represented to Chow Houa the inconsistency of the friendly expressions towards us, whilst the very object of my visit, from which they ought certainly to expect much advantage, was defeated by prohibiting their people from purchasing the things they were anxious to be in possession of, from the few poor people who had accompanied me; that it was bad encouragement for future caravans on a larger scale; but to convince them we perfectly trusted in them, the merchants would remain till their things could be disposed of, and that I would give a note of their names and numbers.

"26*th*. I received a visit from Chow Houa to-day, the purpose of which was to induce me to remain here for two months, till the presents I had brought were sent to *Bankok*[58] and the King's sentiments known. I told him my reception had been such that I could have no objection to remain twelve months, but that the purpose of my visit had been to assure them of our friendly disposition towards them, and open a friendly communication between *Maulamyne* and the *Shan* country; that we had been on the most friendly terms from time immemorial with the King, or I could not have been sent to any of his allies or dependencies; that they were now aware of our sentiments and our anxiety to be at peace with all our neighbours, and that I wished to return on Sunday the 31st.

"29*th*. Paid my second visit to Chow-tche-Weet to-day, who sent in the morning to say he would be glad to see me; I was received as before, but with less stiffness and more cordiality, and there were no armed people in the street. He repeated his declarations of friendship towards the English, which I see no room to doubt; and said the only reason we were not on the same terms as natives of the country, was the bad feeling of the *Zimmay* chief towards us, and

that they had sent to *Siam* to endeavour to bring him under the king's displeasure for having received me as he had.

"I begged to know if CHOW-NI-MOI-KOIN and PONYA-TCHE would be allowed to accompany me, and told him I was anxious to start on Sunday 31st. He said in that case it would be impossible for them to accompany me, and hoped I would wait nine days, when every thing would be ready, and a lucky day, and they should then proceed along with me. After some consideration, I said that though my instructions were to return immediately, I would take on myself to remain. 'Then,' said he, 'every thing is settled very soon; if you have any thing to ask or communicate, do it without reserve.' I then produced the General's pass, which mentions 1100 people, though there are now scarcely 100 remaining, the others having escaped as opportunity offered; and asked what were his intentions regarding those people; and as I had little doubt of his refusing to liberate them, and I had no authority to demand them, I added, that as our friendship was sealed and they were apprehensive of the King of *Siam*, I did not wish to press their immediate release, but begged he would allow the heads of the villages now left (who was the person they had selected to bring the letter to *Maulamyne*) to accompany me, and communicate his case to the Commissioner, that from the constant and friendly intercourse we had with the King of *Siam*, and his having given up our people who were carried off from *Mergui*, I had no doubt of the result. He readily agreed to the man's accompanying me, but begged jocularly that I would not give him up to the Burmans, who were a thorn in their eye, which seemed a signal for the conversation to become general; amongst other things he told me he had 80 wives, 18 sons, and 16 daughters, of whom one is an inferior wife of the King of *Siam*, but has unfortunately no children; that his relations in the three towns amount to upwards of 700; that there were 30 guns in this town, and 40 in *Lagon* and *Zimmay* each; (a Burman prisoner here has offered to eat all above ten in the three places;) that there are 4,000 inhabitants in *Laboung*, 40 or 50,000 in each of the other towns:—this is also of course very much exaggerated. The people who accompanied here to-day, after many pros and cons, received an order to buy forty-two bullocks for carriage. A Chinese who is here (father-in-law to CHOW-TCHE-WEET) is to start to-morrow for *Zimmay*, to bring up some of the principal Chinese traders said to have arrived there, and I have strong hopes, from the enterprizing character of the Chinese, they may be induced to visit the coast,

"I was invited into the fort at 3 P. M. to an entertainment, and had the ceremony called "*Pouk*"[59] performed; beyond which I am told there is no possible mark of friendship. It consisted in two old men saying a prayer of some length for long life, riches, and happiness to one of the English Chiefs of elephants and horses and conqueror of the Burmans, and tying seven threads of white cotton round my wrists: the latter ceremony was also performed by CHOW RAYA WOON, the chief's elder brother, and by CHOW-NI-MOI-KOIN, and I returned the compliment to them. Two large bouquet of flowers, one ornamented with a number of thin silver plates, and some of the flowers being of very considerable but oppressive fragrance, were presented. Sweetmeats were also served up to me, and rice with various curries, both to the people who accompanied me and to the natives, in large silver bowls, to the number of probably fifty, varying in size

from a foot and a half to a few inches in diameter: the workmanship of many of those of the lesser size was remarkably good, nearly all gifts from the King of *Siam*; after which seven of the chiefs' wives danced to the music of the *Bankok* band, by which they set great store, and the music is certainly very pleasing. Many of the women possess a very considerable share of Asiatic beauty: their eyes in particular are large and expressive, without a trace of the Tartar; their skin remarkably fair, and had it not been for the little Burman nose, some of them would have been really handsome. There were probably not less than 300 people present—all the chiefs of *Laboung*, many of those of *Lagon*, but none from *Zimmay*.

"*February 8th.* I have at length prepared to start in the morning by the shortest and best route to *Maulamyne*. The only reason for not starting to-day is its being a *black* one, and it would be disrespectful to me, as well as dangerous to themselves, to begin a journey to-day. I took leave of the chief to-day, and have been allowed as an especial favor to buy one (and CHOW-TCHE-WEET has presented me with another) young female elephant, and sends one as a present to Mr. MAINGY.

"Had another visit from some *Zimmay* people to-day, who agree with the others as to the very friendly feeling of the people there towards us. They say they so fully expected me there, that houses have been ready for the last ten days. On taking leave of CHOW HOUA he gave me a rhinoceros horn, on which he seemed to set a great value, as a charm against every evil; and as I had expressed some impatience at their delays and suspicion, he begged I would not suspect them of any want of friendship in so long withholding permission to purchase bullocks and trade with their people; that our character was perfectly new to them; that they were like an elephant crossing the river;—they must feel before they proceeded; that their difficulty was now got over, they were aware of our intentions being good; and that we should now come there on the same terms as subjects of *Siam*.

"In proof of their sincerity and the trust thus reposed in us, BEYNA-TCHE would accompany me with 50 or 60 people, 2 or 300 cattle, and a number of elephants; that they all lived by trade or agriculture, and that some of the CHOW's sons would certainly next year visit our settlement on the coast. He invited me to repeat my visit next dry season."

On the 9th Dr. R. started on his return: he gives the following account of the route he took, which, until the 15th, was the same by which he had travelled on his way up.

"15*th*. Direction South, 30 West. Time, 4 hours; distance, 10 miles.

"12. 35. I started: most of the people having gone on before me.

"1. 30. Came amongst the hills and commenced to ascend.

"2. 12. Broke off from the old *Mein-lun-ghee* road, leaving it a little to the westward.—2. 20. Crossed the *May-papie* in a few inches of water; path narrow, through low bamboo jungle; hills range about south 70 west, north 70 east.—3. 45. Crossed the *May-Gnoot*[60] and halted on the western side in long grass; the bed of the stream rocky and wide 20 or 30 feet, with but little water at this season. Saw two wild cows and a tiger this evening.

"16*th*. Direction South, 50 West. Time, 6 hours; distance, 13 miles.

"9. March along the banks of the *May-Gnoot*, and continued to ascend with

few declivities; the path rocky.—10. Rocky steep ascent for half an hour.—10. 55. Saw the first pine trees.—11. 30. Left the *May-Gnoot*.—1. 20. We entered pine forest, and no other tree is to be seen but a few stunted yews.—3. Halted on the N. E. bank of a small stream called the *May-lie*, which falls into the *May-ping* to the eastward; the path has been pretty good, and though rocky in many places, I think less difficult than the *Mein-lun-ghee* road: it is the old road to *Martaban*[61], and has been little frequented for the last seven years; the rocks in all the high hills are granite of very dark colour externally. A good deal of thunder and rain this evening; this halting place is famous for tigers; several people have been carried off from it.

"17*th*. Direction South, 30 West. Time, 3 hours, 20 minutes; distance, 11 miles.

"8. 30. Crossed the *May-lie*.—9. 30. Proceeded by a nearly level path along the top of a small connecting range of hills in a noble pine forest.—11. 30. Descended.—11. 50. Halted on the banks of a small stream, the *May-tome*[62]. Path remarkably good and nearly level for the last two and a half hours; some of the pine trees measured eight or nine feet in circumference, and are much taller and straighter than the same trees in Europe.

"18*th*. Direction South, 45 West. Time, 3 hours, 15 minutes; distance, 14 miles.

"8. 45. Crossed the *May-tome*, and continued along a good path; descending for nearly half an hour.—9. 30. Crossed a small stream.—11. 15. Crossed another small stream, and ascended with occasional small descents till 10, when we halted on the southern bank of the *May-tuan*[63], running to the eastward.

"The whole march to-day through the same fine open forest of pine; the path good and the hills not at all steep. Shot a jungle cow to-day: these are abundant in some of the valleys near our route; the flesh was harder than the worst buffaloe. Tigers and the common deer are abundant.

"19*th*. I have been obliged to halt to-day to refresh the elephants, as the passes are said to be difficult and no forage for three days for them: (there are seventeen large and four small ones.) We are now on the site of an old city[64] formerly inhabited by Talines (to whom all the country to the westward formerly belonged) and more lately to the Shans, but has been deserted some years on account of the devastation committed by the Burmans; the valley is of some few miles in extent, and through it runs the *May-tuan* river, which at this season is about two feet deep, and as it falls into the *May-ping*, was formerly navigable for small canoes to *Bankok*; its course is extremely winding.

"20*th*. Direction South, 50 West. Time, 6 hours, 30 minutes; distance, 30 miles.

"9. Ascended along a rugged bad path.

"10. 17. Descended. The firs which have been gradually diminishing in numbers through the whole of to-day's march, are now only to be seen in single trees towering above the other trees of the jungle.—3. 48. Halted in a ravine of very thick jungle on the west bank of the *May-tuan*, running to the northward.

"The march to-day has been the longest as to time, the most toilsome and disagreeable since leaving *Maulamyne*: the path has been either up or down steep hills, or along the bottom of ravines into which the sun can only shine a few

hours in the day ; and since half past ten through a thick jungle. Our course has been all round the compass, and I have been obliged to note its direction no less than eighty times to get at any thing like a correct general direction ; we are again on the banks of the river which we left this morning, the course of which is even more tortuous than the road we have come. We are encamped on a small level spot of a few hundred yards, surrounded by high hills ; the jungle extremely thick, but abounding on the hills with deer of all sizes, cows, buffaloes, tigers, leopards, and rhinoceros. We passed the end of the road, which runs more to the eastward, along which the bullocks are to come ; path is much better, but there are no inhabitants in that direction.

"21*st*. Direction South, 65 West. Time, 7 hours ; distance, 15 miles.

"9. 15. Proceeded along a narrow ascending path in thick jungle.—4. 45. Halted on the *May-Koung*[65], wide 30, deep 1½ feet, pebbly bed, a short way from *Kanoo*[66], a Careen village. The march to-day has been over a succession of hills, some of which were nearly perpendicular, and I should think almost impassable for a loaded bullock, though the elephants have travelled with ease. The path is well shaded, and there is abundance of water : indeed the jungle has generally been so thick that we could only see a little of the path before us, and a ravine or a hill close to the road ; the march on the whole was less disagreeable than yesterday, having been more on the hills. Between 10. 20, and 10. 40, passed a hill, on which there are a great many lofty cinnamon trees, the only ones known by the Careens to exist on any of the hills, and are not at all prized by them ; the bank is about two inches thick, and of good flavour, when fresh, but acquires a bitter taste when dry. Passed some immense trees, called by the Burmans *Couck-Moo*[67], of which the canoes are made ; said to be large enough to make a canoe for 5 or 600 baskets of paddy.

"22*nd*. Direction South, 40 West. Time, 2 hours, 30 minutes ; distance, 7 miles.

"9. Path pretty level ; jungle extremely close.—9. 20. Along the bed of the *May-Koung*, pebbly with large rolled mosses overhung by rocks 1 or 200 feet high.—10. Jack trees ; said to be the site of an old city.—11. 30. Halted in a thick jungle with some betel-nut trees on the western bank of the *May-Koung*. March nearly of the same character as the last two days, but the hills less steep.

"23*rd*. Direction South, 55 West. Time, 8 hours ; distance, 17 miles.

"8. 4. Ascended.—9. 10. Wound up the face of an extremely steep hill from east to west, in a southern direction ; and at 9. 20 ascended along the brow of the hill.—11. 40. Crossed the *May-Tia*[68], and proceeded along a ravine. —1. Recrossed the *Tia*.—4. 45. Halted on the east bank of the *May-Gnow*, wide 90 or 100 feet, running north, 20 west. The hills to-day, with the exception of those on the 21st, were as steep as any we have crossed ; and our progress slow and difficult ; some of the highest hills to-day had been cleared for paddy, and the ground is said to be productive. Met a *Zimmay* slave merchant returning by the route ; he had six slaves, three of whom are about five years of age, for each of whom he gave four bullocks.

"24*th*. We have been obliged to halt to-day till the old road between *Martaban*, and this, which has grown up from disuse, be a little cleared by the Careens for the next two marches, when it again joins the route followed by us in our march up one day from the *Thaung-Ein*.

"25*th*. Direction North, 80 West. Time, 2 hours, 30 minutes; distance, 7 miles and 4 furlongs.

"9. 45. Crossed the *May-Gnow* several times along a level road. At 10 passed a small Careen village, and left the *May-Gnow* to the northward. The Careens had cleared the path through long grass, along the banks and in the bed of the *May-Satang*[69], a small stream of a few inches deep. At 10. 15 halted on the banks of the *May-Satang*, in thick jungle with wild plantains. The path to-day has been nearly level down the course and across the valley of the *May-Gnow*.

"26*th*. Direction North, 65 West. Time, 3 hours; distance, 7 miles.

"9. 30. Proceeded along a pretty good path, crossing the *May-Satang*.—10. 45. Descended and crossed the *May-Satang*, the last time.—11. 40. Side of the hills less steep to-day than some parts of our march, but path very narrow on the brink of a precipice.—12. 30. Halted on the brow of the hill. The road which we have come to-day will be good when more frequented. Except a very steep hill at the beginning of the march, the Careens declare there is no better path through these hills. A considerable part of the march to-day was through an old paddy hill on which the trees had not yet acquired any size, and many of the other hills had been cultivated to their summits within the last year or two. The Careens in this part of the hills must, of course, be pretty numerous.

"27*th*. Direction South, 70 West. Time, 5 hours, 13 minutes; distance, 11 miles, 6 furlongs.

"9. 10. Started, and crossed several hills, or rather heights, on the hills.—2. Came on the paths we travelled on the way up.—2. 25. Halted at our former halting place on the banks of the *Seindzoy-Keum*[70]. The path to-day has been good for elephants, and very passable for bullocks.

"28*th*. Direction South. Time, 6 hours, 40 minutes; distance, 12 miles.

"9. Crossed the *Seindzoy*, and proceeded along the path pursued on our way up.—1. Passed our old halting place on the *May-tha-woe*[71].—3. 40. Halted at our former halting place on the banks of the *Thaung-Ein*[72].

"The first half the march to-day, which was extremely distressing to the elephants from the steepness of the hills, was performed in two hours and a half on our march up, and took us four hours to-day. The last half of the march was more level along the little valley of the *May-thoe-woe*, which we crossed 8 or 10 times, and was performed in very little (10 minutes) more time than we took in the way up.

"*March* 1*st*. Halted to-day on the banks of the *Thaung-Ein*. To-morrow I shall proceed alone, and the Shans will wait for the remainder of the cattle on their own side of the river. The golden sword-bearer is to accompany me one march with four elephants.

"2*nd*. Direction South, 20 West. Time, 4 hours, 5 minutes; distance, 12 miles.

"10. Crossed the *Thaung-Ein* at an elephant's ford about ⅓ of a mile above where we crossed before.—12. 10. Passed *Ween-Wee*[73], our old halting place.

"3. 5. Halted on the old ground at the top of the waterfall[74].

"The path for much the longer proportion of this march was good, and per-

fectly level; the elephants consequently proceeding rapidly, and were up with the people.

"*3rd.* Direction South, 20 West. Time, 4 hours, 20 minutes; distance, 10 miles.

"10. 20. Descended the waterfall.—1. 15. Reached the *Yum-byue*[75] river. —2. 45. Crossed the end of the *Yum-byue* path, by which we marched on our way up, and halted on the beginning of the *Dagyue*[76] path, near our former halting place.

"The descent of the waterfall was less difficult than I had anticipated. The bullocks left *Ween-Wee* this morning, and were up a short time after us. The road on this side of the *Thaung-Ein*, though still amongst the hills, is less mountainous than we have travelled between *Mein-Woot* and that river.

"*4th.* Direction South, 45 West. Time, 2 hours, 45 minutes; distance, 7 miles, 4 furlongs.

"9. Crossed the *Mian-Koung*[77], the path good but narrow, from not having been cut by the Careens.

"9. 45. The whole jungle of short bamboos intersected in all directions with elephants' tracks.—12. 30. Crossed the *Chline-Boye*[78] river, now with only a few inches water, but the bed of the river is 80 or 100 feet wide, with deep banks, probably 18 or 20 feet.—1. 10. Halted on the north bank of the *Kwee--Keung*[79] or buffaloe stream, 10 or 12 feet wide, running to the westward. The path to-day was particularly good and level, but not cleared for a few miles. Some of the people saw to-day a herd of 20 or 30 elephants, amongst which there were *several* males, and some young ones.

"*5th.* Direction South, 45 West. Time, 2 hours, 45 minutes; distance, 7 miles, 4 furlongs.

"9. Crossed the buffaloe stream and marched along a good level path.—11. Halted on the banks of the *Ou-ko*[80], after searching half an hour in vain for a path; the Careens who were sent for this morning at daylight have not yet arrived. The path to-day good, open and level, and, as yesterday, much intersected by elephants' tracks.

"This part of the country was formerly inhabited by the *Lowa-Talines*[81], and the places still bear *Lowa* names; the same race extended to the *Moy-Toum*, before the country was devastated by the Burmans, whose blood-thirsty rapacity has depopulated the whole of this part of the ancient Taline kingdom.

"*6th.* Direction South, 30 West. Time, 4 hours, 15 minutes; distance, 12 miles, 2 furlongs.

"8. 30. Good path through open jungle and long grass.—11. Remains of Careen villages.—11. 20. Plains of considerable extent; marks of wild cattle. —12. 25. Halted in consequence of the jungle in advance being on fire.— 1. 40. Proceeded, and at 2 halted on the south-western bank of the *Chline-Boye* (which falls in the *Gyne*[82], a short distance in a South 70 East direction from this.) Such is the level nature of the country that some of the stream runs into the *Chline-Boye* in the beginning of the rains, and out of it after they have fairly set in. The bed of the *Chline-Boye*, which rises 20 or 25 feet in the rains, is here 80 or 100 feet wide, the water about knee-deep in some places, in others of greater depth, and frequented by alligators; and that of the *Chline-putty* about 30 wide and 25 deep: they were both choked up with fallen trees, and the latter dry at this season.

"The march to-day has been through a level country; the jungle open with long grass, and four or five small plains covered with small bamboos much cut up by the jungle cattle. Elephants' tracks still intersecting in all directions. Saw some rhinoceros' marks to-day; their feet are smaller than the elephants, toes more apart, and the nails longer;—sent off two sick people to proceed down the *Ghine* in boats, under charge of the head Careen.

"*7th.* Direction South, 20 East. Time, 2 hours, 30 minutes; distance, 7 miles.

"8. 30. Proceeded along a good path and level.—9. 30. Plain with long grass. At 10. 45 large plain and paddy stubble covered with upwards of two hundred buffaloes belonging to the Careen village of twenty-eight or thirty houses called *Twine-woot* or *Twine-bot.*—11. Halted at the end of a plain.

"*8th.* Direction South, 35 West. Time, 2 hours, 20 minutes; distance, 10 miles.

"10. 10. Proceeded along the level path, through a country of the same character as yesterday.—2. Bed of the *Tham-bou*[83] river.—2. 30. Halted at a broken bridge over the *Atsong*[84] river on the high road from *Martaban* to the town of *Gyne*, about ten miles from *Gyne*, and at an equal distance from *Domitha*[85], and within sound of the evening gun of *Maulamyne*. The town of *Gyne* was destroyed in a revolt of the Talines about twenty years ago.

"The road to-day good and level; very beautiful plains, less water than usual, but plenty for cattle and passengers.

"*9th.* Direction South, 20 West. Time, 6 hours; distance, 17 miles.

"8. 10. Route continues through level grassy plain with occasional patches of jungle.—11. 11. Paddy stubble.—2. 10. Halted near the *Thaung-thoo* village of *Naung-laung*[86], containing about thirty houses, and probably about 200 inhabitants: found here a body of about one hundred of the annual caravans of the *Shan-Gaung-bee*[87] Shans, who have been nearly four months on the road from their own country in the north. The road to-day level, and generally free from jungle, through plains of fine long grass. The path has been extremely tortuous, and for the last two hours most unnecessarily winding in all manner of directions through a plain of short grass or paddy stubble. The whole of the plains in this neighbourhood are covered with rich green grass, enough for the subsistence of an immense number of cattle throughout the dry season. The waters of the monsoon recede very late from this part of the country, and at that season boats pole across this plain to *Yam-soline*[88], and from thence up the creeks to *Shewe-Ghin*[89], and *Toungoo*[90].

"The path along the plain was much exposed to the sun, and many of the Talines, who suffer more from the sun than the natives of India, were ten hours on the march.

"*10th.* Direction North, 20 East. Time, 8 hours; distance, 26 miles.

"7. 15. Marched along the continuation of the plain till 1. 45, when we halted a few hours at *Dzadi-been*[91].—6. 30. From this proceeded in boats to *Maulamyne*, where we arrived at 9. 20 P. M.

[*To be continued.*]

II.—*Outline of Political and Commercial Relations with the Native States on the Eastern and Western Coasts, Malay Peninsula*. By* T. J. Newbold, *Lieut., A. D. C. to Brigadier General* Wilson, *C. B.*

Note.—It will be convenient to preface, that the subjoined outline follows the geographical order of the States on both coasts of the peninsula; commencing on the north-west with *Quédah*, and proceeding southerly down the Straits of *Malacca* to *Point Romania*—thence turning northerly along the eastern coast up to *Potáni*.

The following is the order of the States, with their supposed boundaries and estimate of population, chiefly derived from native sources in 1835.

Quédah†—from the *Trang* river, in 7° 20′ N. to the *Krian*, 5° 10′ N. Population 50,000.

Pérak—from the *Krian* to the *Rúnkúp*, in about 3° 59′ N. Population 35,000.

Salangóre—from the *Rúnkūp* to the *Lingie*, in about 2° 35′ N. Population 12,000.

Malacca—(British territory,) from the *Lingie* to the *Cassang*. Population, (1833-1834,) 34,333.

Johóre—from the *Cassang* to the *Sedilly*, on the East coast, 2° 15′ N. Population 25,000.

Pahang—from the *Sedilly* to the *Kemámang*, in 4o 15′ N. Population 40,000.

Kemámang—is situated a mile or two up the river, little or no territory along the coast. Population 1,000.

Tringánu—from the *Kemámang* to the *Basut*. Population 30,000.

Calántan—from the *Basut* to the *Barúna*. Population 50,000.

Patáni—from the *Barúna* to *Tana*, in 7° 20′ N. Population 54,000.

The population of *Pinang* in 1833 amounted to 40,322,—that of Province Wellesley to 49,553,—and that of *Singapore*, in 1834, to 26,329.

Quédah, Ligóre, Patáni, Merdilous, Junk Ceylon.—The upper states of the peninsula, viz. *Quédah, Ligóre, Patáni, Merdilous,* and the island of *Junk Ceylon,* are considered in the treaty concluded by Major Burney, with *Siam,* in 1826, as provinces of that empire,—a concession to that arrogant power, scarcely just or politic.

Quédah.—Our relations with the latter four states are merely of a commercial nature,—an unrestricted trade with the ports of *Singapore, Malacca,* and *Pinang.* With regard to *Quédah,* it is stipulated in the above treaty, that the Siamese shall take proper care of that country and its people, and that they shall remain there: the inhabitants of *Pinang* and *Quédah* enjoying mutual trade and intercourse as before. The Siamese engaged not to levy any duty upon stock and provisions; such as cattle, buffaloes, poultry, fish, paddy, and rice, which the inhabitants of *Pinang,* or ships there, might have

* This paper, though rather more of a political nature than is suitable to a Scientific Journal, cannot be refused publication, as it forms the wind-up to the valuable series of notices of the Malacca States already printed in our pages.—Ed.

† It must be borne in mind, that a tract of the *Quédah* coast, called Province Wellesley, about 35 miles long by 4 broad, extending from the *embouchúre* of the *Múda* to that of the *Krian* river, is under the *Pinang* Government.

occasion to purchase in *Quédah:* and the Siamese should not farm the mouths of rivers or any streams in *Quédah,* but should levy fair and proper import and export duties.

The English engaged to the Siamese not only that they would not attack nor disturb *Quédah,* but that they would not permit its deposed sovereign or any of his followers to attack, disturb, or injure in any manner the territory of *Quédah* or any other territory subject to *Siam.* They also engaged that they would make arrangements for the ex-king of *Quédah* to go and live in some other country*, and not at *Pinang* or *Prye,* or in *Peráh, Salangóre,* or any Burmese country. In case the ex-king did not remove, the Siamese were at liberty to levy the export duty upon paddy and rice in *Quédah.*

With Quédah for Pulo-Pinang or Prince-of-Wales Island.—Pulo-Pinang was formally ceded to the British on the 12th September, 1786, for the annual sum of 6,000 Spanish dollars, by the father of the present ex-king of *Quédah,* through the agency of Mr. Light, to whom it had been presented the preceding year as a marriage portion with the Malay king's daughter.

In 1802, Sir George Leith finally arranged that the English Company should pay annually to His Majesty of *Purlis* and *Quédah* 10,000 Spanish dollars, as long as the English should continue in possession of *Púlo-Pinang* and *Province Wellesley.* This last is the line of coast, on the opposite shore, on the main, that lies between the river side of *Qualla Múda* on the north and *Qualla Krian* on the south; measuring inland from the sea side 60 orlongs.

The Company are bound to protect this coast from all enemies, robbers and pirates that may attack it by sea from north or south.

The treaty consists of fourteen articles, and terminates with the following remarkable paragraph. "These fourteen articles being settled and concluded between his Majesty and the English Company, the countries of *Purlis* and *Quédah* and *Pulo-Pinang* shall be as one country; and whoever shall depart or deviate from any part of this agreement, the Almighty punish and destroy him; he shall not prosper."

Pinang was formed into a regular government in 1805.

Pérak.—Pérak is the next state, on the west coast, south of *Quédah.* A notice of its relations has been already given.

Salangóre.—A treaty of commercial alliance, precisely similar to that entered into with *Pérak,* was concluded with *Salangóre* in 1818 by the British Commisioner, Mr. Cracroft.

* He resided and drew his pension in *Malacca* till the close of 1835, when he left it ostensibly for *Delli* in *Sumatra.*

By Major Burney's treaty with *Siam*, 1826, the British are bound not to allow the State of *Salangóre* to attack and disturb that of *Pérak*. The Siamese are likewise bound by the same treaty not to go and attack or disturb *Salangóre*. In 1786 the Dutch dictated a treaty to the then Rája (Ibrahim), by which the latter was compelled to acknowledge the sovereignty of the Dutch, who were then in possession of *Malacca*, and to hold his kingdom from them as a fief. In 1818 the Dutch wished to renew this treaty, but the *Salangóre* chief refused, relying on his newly acquired relations* with the British.

Johóre for the occupation of the island of Singapore.—In 1818 a commercial treaty was entered into, by the then Resident at *Malacca*, Major Farquhar, with the monarch of *Johóre*, who was acknowledged by the Dutch; viz. *Sri Sultán* Abdurrahmán Sháh. Since that time, however, the elder brother of this prince was set up and acknowledged by British policy as being the rightful successor, and in order to obtain a legal title to the island of *Singapore*, which, as will be shewn, was ceded to the Company by the latter. By Major Farquhar's treaty with Ardurrahma'n Sha'h, mutual liberty of navigation and commerce in the ports and dominions of *Johóre, Paháng, Lingin, Rhio*, &c. was secured to British subjects, or persons under the protection of the Company, on the footing of subjects of the most favored nations; the subjects of *Johóre* enjoying similar advantages and privileges in the harbour of Fort Cornwallis, and in all other places dependent on the British Government of *Pinang*.

Sir Stamford Raffles, in a letter to Sir Robert H. Inglis, states that the Dutch no sooner obtained possession of *Malacca*, (in September, 1818, the month after Major Farquhar's treaty with Abdurrahmán Sháh had been concluded,) than, notwithstanding our treaties, which had been publicly communicated for their information on the cession of *Malacca*, they sent an overpowering force to *Rhio*, where Abdurrahmán resided; declared the chief to be their vassal, treated our negotiations with him contemptuously, and dictated a treaty which excluded the British trade from the port, &c.

In consequence partly of the delivering up of a place, so advantageously situated as *Malacca*, to *Holland*, it was deemed politic by the Marquis of Hastings, in order to protect the British trade, and to secure one of the two passages to the Eastern Archipelago and *China*, to attempt the improvement of our relations with *Achín* at the

* *Salangóre*, formerly renowned for its warlike and enterprizing colony of *Bugis*, has dwindled into a weak, piratical state. They were apprehending and preparing for an attack from *Siac* in the middle of last year. The present chief is not remarkable for talent or enterprise. His name is Sultán Mahomed.

northern entrance, and to form a settlement at *Rhio*, an island advantageously situated near the southern extremity. For these and other political purposes, Sir STAMFORD RAFFLES was appointed and associated with the Resident at *Malacca*, Major FARQUHAR, by his Lordship, and proceeded on his mission from Bengal in December 1818.

On arriving in the Straits he found *Malacca* and *Rhio* in the hands of the Dutch, as already alluded to ;—consequently, *Holland* at this time held in her hands the keys of both those gates to the China Seas, the Straits of *Malacca* and *Sunda*.

The *Carimon* isles and that of *Singapore* were almost the only eligible spots now left. The latter, with the concurrence of Major FARQUHAR, and, some say, at the suggestion of Captain Ross, was judiciously selected by Sir STAMFORD, and the British flag there hoisted on the 29th February, 1819. The new settlement was placed in charge of Major FARQUHAR ; who, from his great popularity among the Malays, and local experience, was admirably fitted for the office.

It appears that Sir STAMFORD when off *Singapore* was visited by the *Tumungóng* of *Johóre*, a chief inimical to the interests of Holland, and by no means friendly to the claims of the Sultan newly elected by the Dutch, ABDURRAHMÁN SHA'H, with whom a reluctant and exclusive treaty, as far as regarded the commerce of other European powers, had been concluded by Dutch agents at *Rhio*, which gave them possession of that island. The *Tumungóng* represented to Sir STAMFORD, that the British were still at liberty to establish themselves on the island of *Singapore* under the sanction of the legitimate sovereign, whom he considered to be the elder brother, HUSSAIN MAHOMED SHA'H, whose lawful claims had been set aside by the Dutch in favor of those of his younger brother, ABDURRAHMÁN SHÁH, with whom they had concluded the arbitrary treaty already mentioned.

As the recognition of HUSSAIN SHA'H as lawful sovereign of *Johóre* was a necessary preliminary to treating with him, he was now invited over from *Rhio* to *Singapore* by the British Commissioners, and being acknowledged by the two hereditary elective officers of the empire, viz. the *Bandahára* of *Paháng* and the *Tumungóng* of *Johóre* as their lawful chief, was recognized and treated with as the legal sovereign by the Commissioners ; who forthwith entered into arrangements for the immediate occupation of the port and the establishment of a settlement at *Singapore*, pending a reference to the Supreme Government.

By the arrangement with HUSSAIN SHÁH, of the 26th June, 1819, which appears to have been rather loosely drawn up, it was decided that the British jurisdiction should extend only over a limited part of the island; viz.—from *Tánjong Mallang* on the west, to *Tanjong*

Kattang on the east; and interiorly as far as cannon-shot range all round the factory. The council for the government of the island to be composed of the British Resident, the *Sultan* and the *Tumungong*.

This state of affairs continued with little alteration until 1824, when final arrangements for the entire cession of the island to the British were made, and a treaty of friendship and alliance concluded by the then Resident, Mr. Crawfurd, on the part of the Company, with their highnesses the *Sultan* and *Tumungong* of *Johóre*. This took place on the 2nd of August. By it the island of *Singapore*, together with the adjacent seas, straits and islets to the extent of ten geographical miles from the coast of *Singapore*, were given up in full sovereignty and property to the East India Company, their heirs and successors for ever.

The Company agreed, in consideration of this cession, to pay to the *Sultan* the sum of 33,200 Spanish dollars, together with a stipend during his natural life of 1,300 Spanish dollars per mensem; and to the *Tumungong* the sum of 26,800 Spanish dollars, with a monthly stipend of 700 Spanish dollars during his natural life.

In event of the *Sultan* and the *Tumungong*, their heirs or successors, preferring to reside permanently in any portion of their own estates, and to remove for that purpose from *Singapore*, the Company agreed to pay the *Sultan*, his heirs or successors, the sum of 10,000 Spanish dollars; and to the *Tumungong*, his heir or successor, the sum of 15,000 Spanish dollars. The *Sultan* and the *Tumungong*, in return, relinquishing for themselves, their heirs and successors, to the Company, their heirs, &c. for ever, all right and title to every description of immovable property, whether in land, gardens, houses, &c. of which they might be possessed within the island or its dependencies at the time of their withdrawal from *Singapore*, for the purpose of residing permanently within their own states.

It was also mutually stipulated, that neither party should be bound to interfere in the internal concerns of the other Government, or in any political dissensions or wars which might arise within their respective territories, nor to support each other by force of arms against any third party whatsoever. The *Sultan* and *Tumungong* bound themselves that, as long as they continued to reside within the island of *Singapore*, or drew their respective monthly stipends from the Company, they would not enter into any alliance, nor maintain correspondence with any foreign power or potentate without the knowledge and consent of the Company, its heirs, &c.; to maintain a free and unshackled trade every where within their dominions, and to admit the trade and traffic of the British nation into all the ports and harbours of

the kingdom of *Johóre* and its dependencies on the terms of the most favored nations. Such are the conditions under which the British hold *Singapore* from the *Sultán* of *Johóre*.

Paháng.—Paháng, though virtually independent, is nominally a dependency of *Johóre;* governed by one of its elective officers, the *Bandahára*. It has consequently been included in the relations with that state.

Tringánu and Calantan.—By the 12th article of Major BURNEY's treaty it is stipulated, that *Siam* shall not go and obstruct or interrupt commerce in the states of *Tringánu* and *Calantan*. English merchants and subjects shall have trade and intercourse in future with the same facility and freedom as they have heretofore had; and the English shall not go and molest, attack or disturb those States upon any pretence whatever.

Patáni.—Patáni has already been adverted to as having become a province of *Siam*, on which empire it borders.

Present condition of the Malay States.—Having thus traversed both the eastern and western coast of the Peninsula, I will briefly advert to the political condition of the Malay States as it existed at the time of my quitting the Straits in 1835. The Siamese retained, in spite of their struggles, firm hold of *Quédah* and *Patáni*, which are still groaning under the yoke. The rightful Rája of *Patáni* remained a close prisoner in *Siam*, and his country in a state of depopulation and distress under a Siamese governor. *Tringánu* and *Calántan*, being less under the withering influence of the monarch of the White Elephant, are in a more prosperous condition, carrying on a considerable trade with *Singapore* under their own princes. Both *Tringánu* and *Calántan* have been lately menaced by *Siam*, in violation of their treaty with the British, by which they are interdicted from interfering with these States.—*Kemámang* is a small state, lying between *Tringánu* and *Paháng:* of the former it is nominally a tributary, but bears a *mala fama* on the score of piracy,—a practice said to be countenanced by its chief. The pirates are chiefly tempted by the prows trading from *Patáni*, *Calántan* and *Tringánu* to the port of *Singapore*. *Paháng* was in a peaceable and flourishing state under its *Bandahára*, carrying on a profitable trade with *Singapore*, chiefly in gold-dust. The shores of *Johóre*, though nominally the possessions of our stipendiary the Sultan, are miserably neglected; the creeks, bays, islets, and rivers of this extensive tract affording safe shelter to the hordes of pirates that threaten to extirpate the native commerce of *Singapore*. The states in the interior of *Malacca* were, by the last accounts, still in anarchy and confusion, arising from the fierce feuds and broils which have for some years

past been raging among the native chiefs. *Salangóre* was labouring under serious apprehensions of an attack from *Siac* on the opposite coast of *Sumatra*, the chief of which was said to be collecting a fleet of *práhus* for that purpose. The Rája of *Salangóre* was employed in repairing his fort, and remounting the numerous guns that lay scattered on and around the hill on which the fort stands. *Pérak* was quiet, and occupied in agriculture and the tin trade. Our old ally, the ex-king of *Quédah*, and the Sultan of *Johóre* were living on their handsome pensions at *Malacca*. The latter has since died (September 2nd, . 835). Near the close of 1835 no steps had been taken with regard to the succession. According to treaty, the pension was to expire with the Sultan; but out of consideration to his widow and children, an allowance of 100 Spanish dollars per mensem has been granted her by the Straits Government, pending a reference to Bengal.

The late Sultan first married with the present *Bandahára* of *Paháng's* daughter; by whom he has no issue. By his second wife, the present *Tumúngong* of *Singapore's* sister, he had a son, surnamed *Tuanku besár*, who married one of the *Tumúngong's* daughters, but died without issue. His third wife was a woman of low birth, by whom he has a son now living at *Singapore*, named Abdal Jalil. He is about 21 years of age. Not being of noble blood by his mother's side, his claims to the succession are not considered good by the Malays. By the fourth and present wife, who is of royal extraction, he has two sons, fine lads,—and two girls: they reside with their mother at *Malacca*. The eldest of the boys is considered the late Sultan's heir.

The ex-king of *Quédah*, I believe, left *Malacca* towards the end of 1835 for *Delli* in *Sumatra*. He had, in 1833, expressed to me his determination of doing so, being disgusted at the answers given to his earnest and repeated applications for redress against the Siamese, and to his request for permission to reside at *Pinang*, which had then been recently refused by Lord William Bentinck. He said that he had many friends at *Delli*, and hinted at the possibility of his making a final attempt to expel, with their assistance, the Siamese from his dominions. *Pérak* and the whole Malay population of *Quédah*, and probably that of *Patáni*, are greatly under his influence; and it would require but little persuasion to excite the whole of the neighbouring Malayan States to take up arms against their haughty oppressors.

With regard to British influence over the Malay States, it might unquestionably be much greater than it is; and indeed we might possess almost sovereign power over the whole peninsula, were we

only to exert the political means already under our control. Of later days the fashion has been to treat with them as independent powers; while the chiefs themselves, from a combination of circumstances too long for detail here, are for the most part with difficulty and unwillingly brought to consider themselves so.

Experience has shewn the necessity of the existence of a predominating power, capable and willing to afford effectual mediation, to which these divided States may look up in their frequent disputes.

The Dutch during their ascendancy were fully alive to, and took every advantage of, the influence their commanding position gave them; as the numberless treaties concluded with almost every petty chief on the peninsula and in the Archipelago fully evince: but, by a series of tyrannical and impolitic acts, more particularly the disgraceful system of forced labour, they alienated the affections of a generous race of men, and lost, as a natural consequence, the fruits of their able, though selfish negotiations and political alliances. Britain now occupies a prouder situation with regard to these Eastern States than Holland ever did. Two princes, representatives of the two most noble dynasties, *Quédah* and *Johóre*, derive a handsome subsistence from British bounty. British colonies occupy, and carry on an extensive commerce from the site of those two ancient seats of Malayan empire, *Malacca* and *Singapore;* while British ships retain undisputed possession of the seas. It alone remains for a wise and liberal Government to consolidate and uphold the moral influence of public opinion,—that extraordinary talisman by which is held together the greatest of colonial empires. In the face of such considerations, deterred by the fallacious theories of non-intervention and non-territorial extension, we are incurring the heavy moral responsibility of permitting so great an extent of power, delegated, no doubt, for philanthropic and humane purposes, to lie inert,—a power which, if wielded with discretion, would not only strengthen our political and commercial relations in this part of the globe, but effect the decided amelioration, and, eventually, the radical extirpation of the evils under which these oppressed States now groan.

The absence of the strong hand of power, guided by the dictates of humanity and common sense, to settle the endless feuds of the native chiefs, which are too often excited and supported by the criminal cupidity of native merchants and others residing under our authority (as in the case of the late massacre at *Lúkút*, and the disturbances still prevailing at *Lingie*); the morbid dread of intervention, exemplified in our late treaties, and in our systematical non-support of the native established sovereigns in just authority over their rebel-

lious vassals; the worse than uselessness of British law, applied to a state of society for which it was never framed, are, it is my firm conviction, the remote causes of the present system of piracy now prevailing; of the numerous unpunished murders and outrages which disgrace not only the territories of Malayan chiefs, but also territories lying nominally under the protection of the British flag; and of the impoverished and disorganized condition of the Malays in general.

The resources of the soil have been almost hermetically sealed to the occupier by the frequent and protracted feuds already alluded to. Hence the peasant, driven from his village and lawful means of subsistence, and tempted by the smooth seas, the favorable navigation and shelter from pursuit afforded by the unexplored rivers, creeks, and numerous islets of the Straits, and by the charms of a life so congenial to the free and restless spirit of a Malay, is induced to scour the water for a precarious subsistence by fishing or plunder, or by both, as opportunity chance to present*.

* The *práhus* used by Malay pirates are from eight to ten tons burthen, extremely well manned and remarkably fast, particularly with the paddles commonly used. They are generally armed with swivels on their bows, centre, and stern, of small calibre, but long range. When preparing to attack, strong bulwarks of wood called *Apilans* are erected, behind which the crew ensconce themselves, fighting with their long guns until their prey is disabled; or till the *gong* sound the signal for boarding. But what they mainly depend upon for safety and success is their skill in paddling, (Malay pirates scarcely ever attack except during the lull between the land and sea breeze, or in a calm,) the swiftness of their boats, and their knowledge of the intricate channels between the islands, or over the bars of the rivers into which they generally contrive to escape, baffling their pursuers, and often leaving them aground on one of the numerous shoals or mud-banks which their own superior knowledge enables them to avoid.

The *práhus* of the *Súlú* and *Illánún* pirates are much larger and better equipped than those which commonly infest the Straits. The Malay pirates make their attacks and move in small fleets of from six to twenty *práhus*.

During the months of October, November, December, and January, they will be found cruizing up and down the west coast of the peninsula and the opposite shore of *Sumatra*. From June to the end of September, they are often to be seen among the islets south of *Singapore*, and in the creeks and rivers of the *Johóre* coast. February, March and April are spent in fishing, collecting seaweed, and preparing for future piratical expeditions.

The crews are armed with boarding spears (some of very great length), *krisses*, Malay hatchets and swords (the *parang* and *kleywang*), muskets, blunderbusses, and a variety of missiles, such as sticks pointed and burnt at the end, stones, &c.

The most noted haunts for pirates on the western coast of the peninsula (according to information derived from a Malay of *Salangore*, who had in his

I conclude with a few suggestions touching the suppression of piracy now existing to so alarming an extent in the Straits. Its remote causes, I have already remarked, are alone to be removed by the adoption of a more enlightened policy towards the native powers; and, it may be added, by the gradual spread of civilization and diffusion of useful knowledge.

1st. The employment of one or more small armed steamers, together with eight or ten large boats, of the fastest possible construction, (particularly for rowing;) manned *fully* with Europeans, and well armed for both close and distant fight.

2nd. A discreet *surveillance* over the conduct of the present *Tumungong* of *Johóre;* who is more than suspected of being the mainspring of the daring system of piracy which has so long been an opprobrium to the eastern extremity of the Straits. A threat of withdrawing the stipend he enjoys gratuitously from the British Government might be useful.

3rd. A careful survey of both coasts of the peninsula, the unexplored rivers, creeks and islets. This, in addition to other obvious advantages, will afford opportunities of observing the character and pursuits of the natives inhabiting the sea-shore and banks of rivers, who are always more or less in league with the pirates, and of collecting information of piratical haunts and places of *rendezvous*.

4th. The suspected native chiefs should be peremptorily called upon to lend their assistance and information: particularly the chiefs of *Kemámang, Salángore, Pérak,* and *Calántan*. And lastly, the cooperation of the Dutch Government should be secured.

III.—*A brief account of* Masu'd, *known by the name of Farid Shakarganj or Shakarbár. By* Munshi' Mahan Lal.

[Dated Derah Ghází Khán, 10 miles off from the right bank of the Indus, 10th February, 1836.]

When we reached *Rámú,* a village on the left bank of the united streams of the Hyphasis or *Biás,* and Hesudrus or *Satlaj,* about 150

youth exercised the profession himself) are the *Bánting, Aroe, Cocab, Pisang Dinding* and *Sambilang* isles; those on the *Salangore* coast, and the islets between Cape Rachado and the *Lingie* river. The rivers *Mirbowe, Birman, Perak, Puteh, Koroo, Múar,* Rio Formosa, or the *Battu Pahat* river, and formerly the *Lingie* river: the Straits of *Calang* and *Dryon,* Point *Romania* and its vicinity, and the *Carmion* isles to the south.

On the eastern coast are the creeks and small rivers of *Johóre* up to *Paháng;* the *Kemámang* river; those of *Tringánu* and *Calántan,* also the islands of *Timoang, Pulo Tingie, Redang* and *Aor.*

miles S.-W. of *Lodiáná*, we heard that between the two waters of the Hyphasis and Acesines is a town called *Pák Patan*. It was built in ancient days, and is looked upon as a place of devotion, since the body of Shekh Farí'd reposes there. We crossed the river in a small boat, and bent our route to that direction. The road commenced in a fearful forest, and ended in an extensive hard clayey plain, which environs the above town. It is constructed on a precipice, which is 70 feet high from the surface of the land. The houses are small, both of burnt and unburnt bricks, and the bazárs are narrow, containing some poor shops.

In the year 600 Hijrí, or A. D. 1235, the town was celebrated by the name of *Ajwaddhan*, and was governed by a *Jogí* of that name, tributary to the neighbouring Mahomedan chiefs. When Shekh Farí'd (whose original name was Masu'd) after travelling into Asia and Arabia chose his residence in this town, with the power of his piety he persuaded the *Jogí* to believe in the true faith of Muhammad, and changed the name of the town from *Ajwaddhan* to *Pák Patan*. *Pák* in Persian means holy, and *Patan* in Panjábí signifies ferry, (holy ferry.)

It is added, that after passing some period, the Shekh wished to undertake the *Mujáhedah*, which, I think, imports to labour in defence of the faith, and asked the permission of his *Murshid*, or the guide to salvation, who rests now in the charming place called *Qutab*, about nine miles S.-W. of *Dehlí*. Shekh Qutbuddi'n Bakhtyár, as he is called, answered his pupil Shekh Farí'd to make a "*tai*" or fast for three days. Farí'd did accordingly, and ate nothing for the fixed time. On the eve of the third day some person presented him with a few loaves, which Farí'd ate, thinking that they were sent to him from the invisible world, or "*Ghaib*." Meanwhile, a crow holding the polluted intestine of some dead animal in his beak came and sat on the bough of a tree. Farí'd, on the very first sight, felt an abhorrence in his heart, and, ejecting the bread which he had eaten a few minutes before, his stomach became quite empty. He told the circumstance to Qutbuddi'n Bakhtyár, his spiritual guide, who replied, that God has bestowed a great favor on him, otherwise this meal would have hurt him. "Go now, Masu'd, and fast three days more." As he had not eaten any thing from six days, he became very weak, and the heat of hunger began to burn his heart. He stretched his hand on the ground, and, taking a bit of clay, put it into his mouth, and found that it tasted like sugar. This was the effect of his pure mouth. The following verse says,

سنگ در دست او گهر گردد زهر در کام او شکر گردد

Sang dar dast o guhar gardad, Zahar dar kám o shakar gardad.

"Stone in his hand becomes pearl, and poison turns sugar in his mouth."

Fari'd attributed this favor of God to the tricks of man, so he threw it out of his mouth, and fell deeply again into the contemplation of the Omnipresent. At midnight hunger rendered him weaker than before, and he again got some pieces of earth, and after putting them in his mouth discovered that they were as sweet as sugar. The same thought of deceit came again in his memory, and he threw them once more out of his mouth, and engaged again in prayer as before. By the end of the night Fari'd reflected to himself, that the feebleness caused by hunger might render him unable to stir, so he picked up again some bits of clay and they became sugar in his mouth. He thought they might have been sent to him by God, ate them, and broke his fast in the manner he was directed by his guide Qutbuddi'n. When the sun rose he went to Qutbuddi'n, who told him, "Fari'd, you did well to break your fast with the sustenance sent to you from the invisible world. Go: you will be sweeter than sugar." Hence he was called "Fari'd Shakarganj Shakarbár," or the treasure of sugar.

Books have been written of the miracles wrought by Fari'd. Tughlaq, a man of obscure origin, and the inhabitant of *Abúr*, seven miles from *Pák Patan*, presented him with a load of fuel, and asked nothing for its price. The only petition he made to Fari'd Shakarganj was, to plant him on the throne of *Dehli;* and it happened so by the benediction of Shakarbár. The reign of this person may be remarkable for other things for aught I know; but the large and strong fort he constructed now presents nothing singular to the view except heaps of ruins. It was called *Tughlaqábád*, and is situated six miles south of *Dehlí*.

Fari'd Shakarganj had many followers; one of them was Nizámuddi'n. His body rests in the most handsome place out of *Dehlí*. He was the patron of the famous poet Ami'r Khusrau, who, by the Persians, was denominated "*Totíe Hind*," or the parrot of India, and sleeps on the same charming spot.

The mausoleum of Fari'd Shakarganj is visited by the pilgrims of different quarters. The Hindus of this country believe him to be an inspired man, and pay respect to his monument, like the Musalmáns. After descending a few steps we came into a square laid with bricks, and entered the cupola in which the Fari'd is interred. It is floored with marble slabs, and opens by a door towards the east. On his left hand is the tomb of his son, Shekh Badruddi'n, neither differing in size nor in materials. Over them is a pompous canopy of green

brocade tied with string against the roof of the monument. A small window covered with oil and dust is made in the direction of the south. It is called the "*Darwázah Bihisht,*" or the door of Paradise, and is opened every year on the fifth of the month of *Muharram,* which is the death day of that holy man. The people flock on that day, and, pushing each other forward, rush in at the *Darwázah Bihisht,* and come out by the next door. By doing this they have been persuaded to believe, that they shall have the first place in heaven when they depart for the next world. The monument is 20 paces in circumference, and 30 feet high. It was erected by his disciple Shekh Nizám-uddi'n, *Auliyá,* or the Saint. It is whitened with lime, and has a beautiful appearance when nearly viewed. Fari'd was born in 569 Hijrí, and died of colic in the year 664 H., at the age of 95. The following verse gives the above dates.

رحم فرما شد تولد عابد ازادہ عمر
شد فریدالله سال رحلت مسعود عصر

Rahm farmá shud tawallud ábid ázádah umr,
Shud Farídulláh sále rahlate Masúd asar.

The words *Rahm farmá* we should take for the date of his birth, as, (رحم فرما) 1 40 200 80 40 8 200 or 569 Hijrí. The words *A'bid azádah* stand for the year of his age, as (عابد ازادہ) 70 + 1 + 2 + 4 + 1 + 7 + 1 + 4 + 5 = 95. *Shud Farídulláh* shews the date of his death as (شدفریدالله) 5 + 30 + 30 + 1 + 4 + 10 + 200 + 80 + 4 + 300 = 664. "*Faríd asrí*" or the gem of the time, is another date of his death as (فرید عصری) 10 + 200 + 90 + 70 + 4 + 10 + 200 + 80 = 664 H.

Next to this monument in the same square is another dome built by Tughlaq Sháh. It contains the tomb of Shekh Alah-uddi'n, Moizzuddi'n and Shekh Fazl, &c. &c. the descendants of Fari'd. The height of this dome is nearly 50 feet, and the circumference 36 paces. It is larger than the former, and has a door opening to the south. It looks older, because it has never been repaired. All of the graves were veiled with dust, but a few flowers lying over them showed that they are also occasionally visited by the people. The accompanying is the drawing of the Fari'd's monument, which I have done by the means of a *camera obscura**.

* Our young friend has evidently not yet acquired the knack of the camera obscura (lucida?). Out of consideration therefore for the memory of Dr. Wollaston, its inventor, we omit his unsuccessful attempt to use it.—Ed.

Connection of Mithraic with Hindu Coins.



Hindu Coins. Canouj Series.

with Ardokro reverse.



IV.—*New varieties of the Mithraic or Indo-Scythic Series of Coins and their imitations.* By James Prinsep, Sec. As. Soc. &c.

From the variety of the Mithraic reverses already made known, it might have been imagined that the series was nearly exhausted. Every year, however, adds a few new types to our previous list, or produces finer samples of these hitherto considered indistinct. So multiplied, indeed, are our resources at the present time, that we can afford to be fastidious, and not only reject coins of the baser metals, but limit the admission even of golden novelties to those of one size, weight and value!

My object in Plate XXXVI. is to develope more fully the transition from the Mithraic or Indo-Scythic coinage to the Hindu series, for which my numerous friends have furnished even more unequivocal links than those engraved in my former Plate, (XXXVIII. of Vol. IV.) I must begin, however, with a few novelties of the true Mithra type.

Fig. 1 is the first to rivet our attention and curiosity. It is an unique of Mr. Masson's discovery. The *obverse* has the usual standing figure of the Rája sacrificing, with the legend PAO NANO PAO KANHPKI KOPANO. The *reverse* has an armed figure, nearly the counterpart of the other, but without any altar, and with the usual monogram: the legend being in Masson's drawing, OPAAΓNO. Not having the coin itself before me, the reading I venture to substitute for this, is of course liable to correction; but the strong similitude between the commencement of this legend and of the two curious ones formerly noticed, namely, APΔOXPO and APΔHΘPO, leave little doubt in my mind that the one before us should be read APΔAΓNO; the word AΓNO representing the Sanscrit अग्नि *Agni*, the god of fire; whom we may reasonably suppose to be substituted for *Athra*, as the Sanscrit अर्क *Arka* has been for *Mithra* in the Indianized designation, OKPO. The Pehlevi affix APΔ *Arda* (generally written APTA by the Greeks) implying 'the great,' bears an evident connection with आर्य्य *Arya*, a common Sanscrit epithet of the same signification, 'excellent;' or आर्य्य *A'rya*, holy, venerable; as अर्य्यमन् *arya-man*, the sun, आर्य्यवर्त्त *áryavarta*, the holy land, (India) &c. *Aria* also occurs in combination in Persian names beginning with consonants, as *Ariobarzanes*, king of Armenia,—a derivative from *Berzin*, the planet Jupiter of the Mithraic system*.

Further search, should these conjectures be well grounded, will probably bring to light coins with the single appellation AΓNO, which has not hitherto been observed.

* Vaillant Ars. Imp. I. 183.

Fig. 2 is misplaced: for the imperfection of the Greek legend on the *obverse*, ought to condemn it to a lower grade in chronological order. All those legends which have the family name of KANHPKI are clear and better formed than those of OOHPKI to which this coin belongs. The latter, too, have generally the bust of the sovereign substituted for the full length sacrificer. The name on the *reverse* of *fig.* 2, ΦΑΡΟ, is new; nor is it at first very obvious what meaning it may be intended to convey. It cannot well be a corruption of ΔΘΡΟ, because the standing figure faces the opposite way—holds a spear, and wants the flames on his shoulders. Mr. Masson observes on this coin: "Here is another peculiar legend, but evidently signifying the sun as source of light and majesty. *Pharos* was the term applied to the Alexandrian light house, and *Pharoah* is the well known Scriptural title of the old kings of Egypt. The bust on this coin affords a remarkable contrast to other coins of the family." It is certainly probable that the word has some affinity to the Greek *φαος*, *lumen, dies, solis ortus*, but no more than is naturally found between languages of common origin. The word *Phraa*, or something like it, certainly existed in the ancient language of Persia, as the personification of light or heat—analogous to *Mithra*, the sun*. In compounds it is frequently found, as in *Phraates, Phraortes, Farnaces*, and *Phradates;* the latter being altogether congenerous with *Mithradates*, or as the Greeks translated the name, *Apollodotos*. From the same root are descended the modern Persian verb افروختن to inflame, whence افروز illuminating, so often employed in compounds. Perhaps the uncouth name of *Unad-Pherrou*, on a numerous class of the deteriorated Bactrian coins, may spring from the same root.

Vaillant, however, gives a different and, I think, a less satisfactory etymology of the above class of names in his history of the Arsacidæ. "*Phriapates* seu et *Phrapates*, idem ac *Aphra Pates*, seu et *Papatius;* nam apud Persas idem *Aphra* est, ac *Pa* apud Turcas Scythasque, scilicet elevatus, supremus, maximus, quæ nominibus propriis ut et *art* præponuntur." (Arsac. Imp. I. 2.) Now if the word *aphra* be merely an intensitive preposition, like the Sanscrit पर *para*, the Persian بر *ber*, the Greek *παρα*, and the Latin *præ* or *per*, the word to which it is affixed should be a significant adjectival noun, as पराक्रमः *parákramas*, the very heroic; اردشير *Ardashír* (Artaxerxes), the great lion, or very valiant, &c. The participial nouns *Mithradates* (quasi مهرداد the given of *Mithra)* and *Phradates* (افراداد the given of *Phra)* require the first member of the compound to be a noun.

* *Phre* in Egyptian has precisely the same meaning as *mihr* in Persian, 'king, prince.'

Fig. 3. A type familiar to us, in copper—and known before in gold of a smaller size. It was, in fact, one of the two coins first extracted by M. VENTURA from the Manikyála tope. In Mr. MASSON's coin the spelling accords with the vernacular pronunciation MIIPO, and the solar glory is irradiated on its edge, to shew more plainly its reference.

Figs. 4 and 5. Two more gold coins of Mr. MASSON's collection, having the legend of the reverse respectively NANO PAO and NANA, both proved to be equivalent to NANAIA by the peculiar attitude of the allegorical image. The introduction of PAO in the first of the two would almost seem a mistake of the engraver, who had in his mind the PAO NANO PAO of the obverse. I have nothing to add to my former remarks on the word itself, except to draw attention to an extract from the Armenian Chronicles with which Mr. AVDALL has favored us, proving that NANAIA and the Persian ANAHID were not positively identical, each having her separate temples and votaries even in Armenia.

"*Anahid* was the tutelary goddess of our country, and was known equally by the names of Artemis and Aphrodite in our mythological works. She was always considered identical with the planet Venus, though possessing all the attributes of Diana." As *Nanea*, on Mr. AVDALL's authority, means *maternal* or *motherly*, it would hardly be proper to ascribe such a designation to the moon, the chaste Diana; neither has her effigy on our coins the lunar emblem, so distinctly portrayed on the MAO and some other types. Rather then let her be constituted the *Venus* of the group, who plays an equally conspicuous part in the Mithraic system*.

Fig. 6. Is a gold coin from M. COURT's drawing, of the AΘPO *reverse*. The *obverse* legend is PAO NANO PAO OOHPKI KOPANO.

Fig. 7 is likewise from M. COURT's collection. In it I was struck by the strong resemblance of the head-dress to that of the Parthian or Sassanian coins. The legend is wanting, and that of the reverse is quite illegible, though the monogram and device are in a perfect state.

Fig. 8 has been already engraved in my plate of the Manikyála relics; but as one of the most interesting of the Mithraic series, it could not be denied admission in a plate exclusively devoted to them. I wished further to place it in juxta-position with the sitting figure of the APΔOKPO reverse, because it might be conceived to be the parallel Hindu *lunar* coin to that form of the Hindu *solar* effigy, OKPO.

* The Baron HAMMER says that the word *Neith* of the Egyptians is evidently the same as the Persian *Nahid*—whence also may be traced the German *Nacht* and the English *Night*.

Like OKPO, this figure has four arms, and is therefore Indian: further it is a male divinity; and thirdly, it is identified with MAO, the moon, by the crescents of that luminary arising from its shoulders. It must therefore be *Soma* or *Chandra* of the Hindu pantheon, who is represented with all these characters in MOORE, though a later work by Mr. COLEMAN makes him to be a two-handed divinity.

The appellation MANAOBAΓO, which so puzzled me on the former occasion, has at length, I think, found a satisfactory explanation. *Máng*, ماڼگ in Persian, is an ancient name of the moon,—and *Bhaga* भग in Sancrit, means splendour, glory; and is given as a synonyme of the moon as well as of the sun. In the Zend, then, the link between the Persian and Sanscrit, we may naturally look for a compound of these two terms, such as *manao-bago*. It is well known that the mythology of the Saxons was derived from a Scythic or central-Asiatic source, and their *male* deity MONA (whence our modern term, moon*), has been by the learned referred to the Persian *Mang*. I have, however, found a much more convincing proof than these analogies afford, that such is the correct explanation, in the Baron VON HAMMER's Prize Memoir '*sur le culte de Mithra, son origine, sa nature, et ses mysteres*,' *Paris*, 1833; for a copy of which I am indebted to the learned author's perusal of my observations on the curious relics from the Panjáb.

In the catalogue of Mithraic inscriptions discovered in various parts of Europe, the Baron points attention to one in particular among GRUTER's collection, in which the word MENOTYRANNUS denotes the deified moon:

"Cette inscription est une des plus interessantes à cause des deux mots de *Menotyrannus* et de Persidicus: le dernier indique l'origine persane du culte de Mithra: le Menotyrannus peut se traduire par, seigneur du mois; mais malgré les objections de M. Rolle contre l'existence du dieu *Lunus*, je crois que cette existence peut trés-bien étre prouvée, non seulement par tous les monumens astronomiques des orientaux modernes, dans lesquels la lune est représentée sous la figure d'un jeune garçon de quatorze ans, mais encore par la coincidence de la mythologie Egyptienne dans laquelle la lune, d'aprés les decouvertes de M. Champollion, est une divinité mâle. Enfin le mot MHN dáns lequel M. Rolle ne voit que le nom d'un mois, est effectivement un nom persan de la lune qui s'appelle *mah* et *mang*; c'est le *moon* des Anglais et le *mond* des allemands, lesquels lui ont conservé son genre oriental."

* In like manner I feel strongly disposed to connect the strange OAΔO of our coins with *Odin* or *Woden* of the Saxon mythos, an acknowledged derivative from the Sanscrit बुद्ध *Buddha*, Mercury. It is not a little curious that the verbal root of two of our present days of the week, Monday and Wednesday, should thus be discovered among a parcel of old coins dug up in the Panjáb!

After this we can have little hesitation in translating MANAOBAΓO 'lord of the months:'—indeed if we derive BAΓO from the Persian or Scythic بیگ *beg*, 'lord or prince,' we shall have precisely the corresponding term to *tyrannus*.

Fig. 9. A gold coin of KANERKOS from a drawing by M. COURT. The *rao* in this seems to have a case for his bow strung behind his back. The *reverse* is similar to that of a fine coin of OOHPKI in General VENTURA's series (fig. 9. of Plate XXXVIII. Vol. IV.) which however differs in having the bust in lieu of the full length of the prince. The legend APΔOXO has been before explained as "the great sun*." One of his attributes it may be presumed rather than the god himself, is intended, by the female holding the cornucopia—typifying the fertility he bestows on the earth.

Fig. 10 is a most important acquisition to our Mithraic series, as being the very link of connection between them and the *Canouj* coins. Immediately after the publication of my former plate, Lieut. CUNNINGHAM wrote to me from *Benares*, pointing out a coin in his cabinet of the class I had designated links, having the seated female with the cornucopia, but more perfect than those I had engraved, inasmuch as the legend to the left was preserved and legible as APΔOXPO, the same as that of the standing figure. A duplicate of the same coin was also in Colonel STACY's cabinet, and on reference to the Asiatic Researches, Plate I., the letters of APΔOXPO were clearly legible on the reverse of fig. 6, a gold coin procured by Mr. WILSON from the bed of a tank in the *Húglí* district.

The cornucopia as a device seems to have been copied from the Roman coins of the Emperors. It is seldom or never to be seen on the genuine Greek coins—nor is it found on our Bactrian series until the age of *Azos* (with exception of the copper coins of ANTIMACHUS and PHILOXENUS, the date of which is uncertain). Whether it bears any direct allusion to the legend may be doubted,—at least such allusion is entirely lost sight of the moment we pass the boundary into the Indian series.

Hindu coins imitated from the Ardokro type.

Since my former paper on the *Gupta* coins of *Canouj* appeared, very important acquisitions have been made to our knowledge of this before unknown dynasty, through the medium of coins and of inscriptions; for both of which we are almost entirely beholden to the researches of Lieut. A. CUNNINGHAM and Mr. V. TREGEAR in the neighbourhood of *Benares*.

* The OPOOKPO of the copper coins may be deemed a still closer imitation of the Sanscrit आर्य्यक *Aryárka*. APΔ is the Persian orthography.

The inscription in an ancient character upon the column at *Allahabad* interpreted by Capt. Troyer and Dr. Mill in the 3rd vol. Jour. As. Soc. had made us acquainted with the four first of the family* ; namely, 1, Gupta, a Rája of the solar race : 2, Ghatot Kacha, his son : 3, Chandra-gupta, his son : 4, Samudra-gupta, the fourth in descent : —and there the *Allahabad* record broke off with an intimation that a son was *expected.*

The *Bhitari láth* brought to notice by Messrs. Tregear and Cunningham, fills up the line of succession for three generations further (see Plate XXX. of the present No.). We may so far anticipate the translation of this highly important record promised to us by Dr. Mill, for the illustration of our subject, as to state that the infant of Samudra was named Chandra-gupta II. His son was, 6, Kumara-gupta ; after whom followed, 7, Skanda-gupta—and there again this new authority breaks off.

Now to all of these (excepting perhaps the first) we can at present assign their respective coins from undoubted and numerous specimens, and the succession of the devices on the obverse and reverse will be seen to follow just that modification from the original Mithraic model of the *Ardokro* coin, as would be expected when the source was nearly forgotten, and Hindu ideas became predominant. Moreover, we can, from our coins, add the name of Mahendra-gupta, and perhaps of Assa-gupta to the list, and there is presumptive evidence of a second Samudra as of a second Chandra. Altogether we may reckon upon nine or ten generations, which at an average of eighteen years will fill a space in Indian history of nearly two centuries, of which no written account can be met with ; unless the passage in the *Vishnu Purána*†, that the *Guptas*, a *Sudra* family, reigned over a part of *Magadha*, at the time of its compilation, be regarded as alluding to our dynasty. The sites whence their coins have been most frequently obtained, certainly agree with this description ; but the date assigned to the *Purána* must in this case be carried back a few centuries, and by the *Mlechhas* of the Indus must be understood the Indo-Scythians rather than the Musalmans. But I had intended to confine myself to an enumeration of the new coins, and to postpone speculation until we are thoroughly acquainted with them. To proceed therefore :

Fig. 11. One of two gold coins of Capt. Cunningham's cabinet (the first procured at *Benares*, the second in *Calcutta*, now with Dr. Swiney). It is a duplicate of my own (from Lieut. Conolly) with the unintelligible legend, engraved as fig. 23 of Plate XXXIX. It was

* See Vol. 3, page 344.

† See Wilson's analysis of the *Vishnu Purána*, Jour. As. Soc. I. 440.

then alluded to as having the letters a little different from mine, and was read *Kragipta Paragu (pta)*. Upon full consideration of each individual letter as compared with those of other coins, I do not think the second letter a *g*; it is rather a *bh*, and the reading altogether कुभावुपरगज, *Kubhávu paraguja* (adding the *ja* from the obverse of my own coin, where it is quite distinct). Now we have gained experience enough from our reading of this class of coins to expect that the legend, where it does not merely embrace the titles of sovereignty, will express some extravagant epithet. The final *ja* also (implying *born of*,) shews that the said epithet belongs to his father; and this will account for the omission of *ja* on one side of the coin, which would have the effect of making the epithet apply to the son also. The present compound may thus be made up of कु *ku*, a diminutive particle; भाव *bháva*, the mind; उप *upa*, a particle implying similitude; रगु *Ragu* (for RAGHU) the grandfather of RAMA, and ज *ja*, born of * or, united by *Kubháv-uparagu-ja* 'of the humble-minded, resembling-Raghu-born.' The name is unfortunately cut off from the margin. Two letters of it are visible under the Rája's arm on the obverse, and look like अस *Asa*: but on reference to my own coin, I have there no hesitation in reading it समुद्र SAMUDRA. The coin is in this case wrongfully placed at the head of the group in the plate, but as there are two coins to one in favor of the reading *Asa* I still hesitate to remove it, for *Assagupta* is a known name in the *Cashmir* list; and it is, moreover, so like our Azos, that one feels inclined to discover in it a coin of YAVANASO himself, the supposed founder of this *Canouj* dynasty.

Fig. 12. This beautiful coin is an unique in Mr. TREGEAR'S possession. It is valuable on every account: as giving an additional link with the Mithraic coins (fig. 9), in the standing cornucopia-female; as adding a new and much desired name to the coin list; and as teaching a good lesson, in the most unequivocal and well formed Nágarí, of the style of legend adopted by these sovereigns; to whom, whether from their extra-Indian, or their low origin, or their limited sway, the panegyrist seems to have avoided applying the usual epithets of royalty, *maháraja dhirája*.

On the *reverse* the reading seems to commence, सर्वराजोच्छत्र *Sarva-rájochhatra*, 'the chatta or overshadower of all the Rájas'—then, on the right of the obverse, कामनरुत्तमज घ.... *Káma-naruttama-ja Gha-* (*tót ?*) and under the left arm, written perpendicularly in the Chinese fashion क च KACHA. 'Son-of-an-excellent-man-resembling-KAMA,

* I have worked out this solution, dictionary in hand; for the Pandits could not aid me in the least: it is therefore quite open to criticism.

Gha(tot) Kacha.' The only portion of this inscription missing is the second syllable of *Ghatot,* which may be replaced with confidence. The Rája is sacrificing on the small Mithraic altar, and is dressed much in the Kanerkos style, though more fashionably.

Fig. 13. Next in succession to Kacha comes Chandra. Of his coins I have already supplied several examples, (see Nov. 1835, fig. 18, also Marsden MLVII.,) but to keep up the comparison of the reverses, I here insert a very perfect sample from Lieut. Cunningham's cabinet, procured at *Mirzapur.* Legend on the obverse राजश्रीचन्द्र *Rája Srí Chandra* (the rest only partially visible), and under the arm again च न्द्र *Chandra;* on the *reverse* श्रीविक्रम *Srí Vikrama.* I do not find any instance of the name on this form of coin being written *Chandra-gupta,* although it is distinctly so on the pillar-inscriptions. He is the first to change the trident standard of OOHPKI for the (quasi) Roman eagle. He also prefers the bow to the spear.

Fig. 14. Lieut. Cunningham's, from *Gaya,* similar to my own (Capt. Wade's) of fig. 16, Plate XXXVIII. Vol. IV. *Fig.* 17 of that plate is another; and seven are now known of the same type, dispersed among us: but few, if any, have the marginal inscription so well developed. As all the coins bearing simply *Vikrama* on them may be set down to Chandra-gupta, so all having पराक्रमः *Parakrama* may be assigned to his son Samudra-gupta the first. This legend is attached to the same sitting female as before on the reverse. The Rája on the opposite face is just like his predecessors in costume and attitude, with spear and eagle standard.

By means of Messrs. Cunningham's and Tregear's coins, added to my former specimen, the long legend on the obverse can be nearly all restored; it appears to be समर शत सतग.... वजयजतर.... *Samara ṣatamataga (ja)*.... which may be translated 'having the strength of 100 *must* elephants,' and on the opposite margin *vijayajatara*.... In my former specimen, however, the final portion read *Aparajita davaja.*

Under the arm the word समुद्र Samudra is written in the perpendicular form, the *u* being apparently placed *above* the *m,* because the *d* had taken its proper position below.

Fig. 15 is another *Chandra-gupta,* from Col. Stacy's box, of which Mr. Tregear has a duplicate. Another is engraved in Marsden, *fig.* MLVIII. From the alteration of the device, and particularly the omission of the fire altar on this coin, we might with plausibility set it down to Chandra-gupta the second,—but on the same authority we might make two Samudras; for these princes seem to have imitated one another so closely, that we find the device of the Rája and his wife

(?) like that of the Rája and eagle standard, repeated on the *Samudra* coin (fig. 12,) and at a later period on a coin of SKANDA-GUPTA (fig. 24, of Plate XXXIX. Vol. IV.) with a change of costume. The Rája's name on this coin is disposed in two perpendicular lines one on each side of the spear च|ग / न्द्र|प्त *Chandra-gupta*—the second line, not very clear in Col. STACY's coin, is quite distinct in Mr. TREGEAR's, which reached me just too late to be substituted in the engraving. On the reverse, the cornucopia lady is seated on a sleeping lion—as if to express 'all will go on prosperously if ye rouse not the wrath of your ruler.'—On the left hand are the words पच्छवय : in the ancient character. The upper prolongation of the *p*, perhaps, indicates an *anuswara*, and thus the reading may be पंच्छवय : *Panch-chhavayas*, 'the five excellencies;' to wit, of a king.—There is a fault in orthography, however, here, as in the legend of *Ghatot kacha :* the words should be written पच्च छवय : *Pancha-chhavayas*. Whether the word *chhavaya*, 'light,' may have any allusion to the five luminaries of the Mithraic worship; the sun, the moon, fire, Jupiter, and Venus, it is impossible to say :—but that a king should possess five virtues, we learn from various Hindu authorities.

Fig. 16. An unique in Captain CUNNINGHAM's collection from *Gaya*. The female of the reverse having in the last quitted her Grecian seat, has been here installed in one of a more genuine Hindu character—the lotus flower. There is a peculiarity also in her attitude, both hands being turned up, and the elbows resting on the knees. The legend is unfortunately cut off. On the *obverse*, however, to the left of the usual Rája, we have in very conspicuous letters superposed in the usual style कुमार : *Kumara*—proving that this is a coin of KUMÁRA-GUPTA, the successor of CHANDRA-GUPTA the second, and thus far in accordance with the Bhitari monument. Lieut. CUNNINGHAM has another of the same prince, of quite a different type, (described in Vol. IV. page 637,) but what confirms KUMARA's succession to CHANDRA the second, is, that there are devices common to the two which belong, as far as our researches yet go, to no others,—as if on the accession of the new prince the mint had continued the preceding device, mutato nomine, until another was subsequently selected by the rising monarch. (See figs. 27 and 28, Plate XXXIX. Vol. IV.)

Figs. 17 and 18. For our acquaintance with the owner of the next coin in our series we are entirely indebted to Lieut. CUNNINGHAM. He first extracted his name from the *Bhitari-lâth* inscription,—and subsequently traced it on these two unique coins in his own, and on

one of my, collection, already published; (fig. 24. of Plate XXXIX. Vol. IV.) Fig. 17 is from *Gaya*, and fig. 18 was dug up near a village four kos from *Ghazipur*.

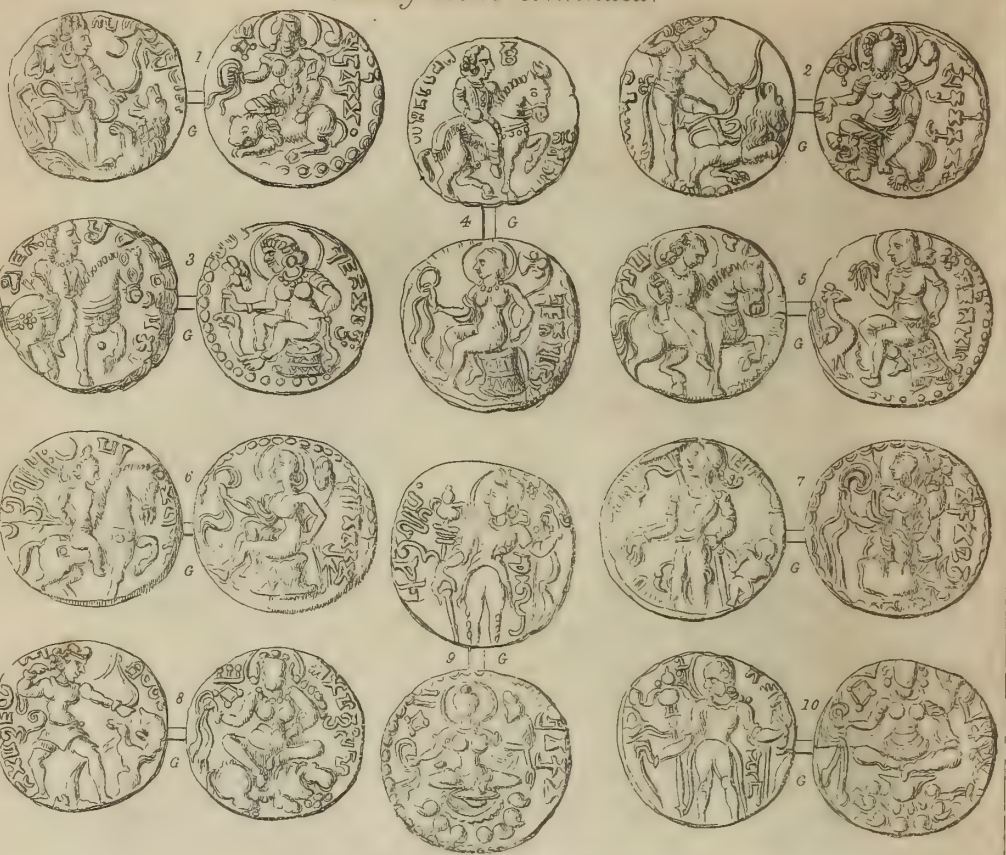
On the *obverse*, the general attitude of the Rája is the same as usual—the waist a little more fashionable, the gaiters absolutely those of the last century! and the hair or wig commencing to be curled in parallel rolls, as will be more fully developed hereafter. The name perpendicularly disposed under the arm of both figures is quite clear, or स्कन्द *Skanda;* while on the reverse of Fig. 18, it is as decidedly (in the old character) श्रीस्कन्दगुप्त *Srí Skanda gupta*, the very name of the *Bhitari-láth* successor to Kumára.

On comparing the plates in the Researches and Journal of the coin given to me by Mr. Bacon, many years ago, and then thought rather suspicious, Lieut. Cunningham soon found its legend to be identical with his own,—a fact fully confirmed by re-examination of the coin itself. These three, however, are the only coins yet known of this name. One of them No. 17, exhibits a new name on the reverse, for, unlike 18, it is certainly not *Skanda-gupta*, but क्रमसन्दः *Kramamanda*, which may be looked upon as a rhyming epithet—"equal to (or surpassing) *Manda*" (Saturn or Yama). Mr. Tregear has lately got a duplicate of this coin—in which the reading is rather क्रमसंवान्दः—one and both may possibly be intended for श्रीमहेन्द्रः *Srí Mahendra*.

Figs. 19, 20. We now pass to another new acquaintance made out jointly by Lieut. Cunningham and myself on a general inspection of the *Gupta* coins. Fig. 19, is in the Society's collection, and is engraved as No. 14 of the Plates in the 17th Vol. As. Res. unread by professor Wilson. Upon recognizing the final letter न्द्र *ndra*, we soon perceived the preceding letter which I had before mistaken for a *ph*, or *n̆*, to be the old ह, *h*, and thus with the vowel above it, the name was immediately cleared up as श्रीमहेन्द्रः *Srí Mahendra*. Another coin from *Gaya*, belonging to Lieut. Cunningham, turned out to be of the same individual as to the reverse, with some variation in the legend of the obverse. Under the arm of the latter, the letter कु *ku* seems to denote a *Kumara;* but on the margin are evidently the words जयते महेन्द्र *Jayaté Mahendra*. On the Society's coin, fig. 9, the marginal inscription is more complex—परमरजतर, as yet unintelligible; then between the feet श्री *Sri*, and near the hand the letter गु *gu* (of *Gupta*) the intervening name being cut off.

Pursuing the examination, we found the coins 29 and 30, of Plate XXXIX. Vol. IV. with the Rája on horseback, and the seated female

Canouj Coins. Continued.



Copper Coins of Chandragupta



Second Series of imitations from the 'Ardokro' type



feeding the peacock, to belong also to MAHENDRA-GUPTA. *Ajita Mahendra* on the reverse and *Mahendra-gupta* on the obverse of 30, are quite clear. I was before only misled by the letter *h*, which I read as the nasal *n* of the *láth* alphabet.

I shall have occasion to recur to this name in the next plate, which contains those new forms of the *Canouj* coin that are without the cornucopia female, and have not such direct analogy to their Mithraic prototype as is palpable in the whole of the reverses included in the lower half of the present plate.

Plate XXXVIII.

Figs. 1, 2. These two coins, from Mr. TREGEAR'S cabinet, are variations only of the original coin given to me by Lieut. CONOLLY, now became celebrated as having opened the door to the understanding of the whole group. In that coin, however, the archer holds his bow in the wrong hand, whereas in the two present coins, and the one following, the position is rectified and the lion is better developed, particularly in Fig. 2. Besides adding these fine specimens to our series, Mr. TREGEAR has made out the true reading of the legend on the reverse. Instead of *Saccha* or *Pradya* the word is सिंहविक्रमः *Sinha Vikrama*, 'the lion hero,' which is consistent with the device, for it may be also understood as 'conqueror of the lion*.' To whom, however, this title is to be applied, would still have remained doubtful, but for the fortunate discovery of another coin by the same indefatigable collector in the prolific neighbourhood of *Jonpur*, while even I was engraving the present plate.

Fig. 8, the coin here alluded to, bears precisely the same device, with variation only of the attitude of the warrior. The legend is different, the part visible being on the *obverse*, श्री . . तमहेन्द्र जय *Srí . . ta Mahendra jaya*, and on the *reverse*, श्रीमहेन्द्रसिंह *Srí Mahendra Sinha*. Whether the *Mahendra* here designed be distinct from the MAHENDRA GUPTA of the cornucopia reverse, remains to be ascertained.

Figs. 3, 4, 5. From Mr. TREGEAR'S collection. These three coins bearing the Rája on horseback on the obverse, and a female seated sideways on a morha or wicker stool on the reverse, are essentially the same as were published in November last, (figs. 29, 30, Plate XXXIX. from Lieut. BURT'S and my own coins) which I was then, however, unable to read satisfactorily, from misapprehension of the

* It is remarkable that in most cases the word *Sinha* (or more properly *Simha*) is written with an unknown letter superposed to the ह्. This must be the nasal *m*, for which the *anuswara* is now substituted. In fig. 2 the letter is palpably an ञ, *m*, to which is subjoined the *h* ह; but in figs. 1 and 8, and in my coin, the letter has the form of ⊏.

letter *h*. The legend is in all exactly the same on the reverse, अजित महेन्द्र *Ajita Maheudra:* 'the unconquered MAHENDRA.' The female holds, in her right hand, variously, a flower, a noose, or food for an attendant peacock, like that of the *Kumára* coins.

On the *obverse* the legend is more variable.

In No. 3, we have the letters अजित पुव. . . . तविक्र. . . .
In No. 4, not legible. . तवि
In No. 5, ह्य . . not legible.

Fig. 6. (TREGEAR). This coin resembles in all respects the foregoing, excepting as to the legend, which is on the *obverse*, beginning at the top परमेश्व. . . . न्द्रगुप्तः *Paramès* (*vara ? Cha* or *mahè*) *ndra-gupta*. On the reverse (the second letter being very clear on a duplicate coin in Capt. CUNNINGHAM's cabinet) अजित विक्रमः *Ajita Vikrama*. This name so closely resembles the common pronunciation of *Vicramajit*, (correctly written VIKRAMÁDITYA,) that although it may not belong to that celebrated sovereign, it is very possible that matters appertaining to the history of the one may have been transferred to the other, and hence some of the confusion, so perplexing to the historian, have originated.

Fig. 7. An unique lately procured by Mr. TREGEAR. The Rája on the *obverse* is of a peaceful character, with hand extended but no altar. A diminutive attendant holds a chatta over his head. The letters on the margin are not legible. On the reverse is the standing cornucopia female holding a well depicted lotus flower, with a lateral inscription which may be read विक्रमादित्यः *Vikramáditya;* but although the length of the subjoined *y* exceeds that usually found in the *d*, and the *di* is not much like the *ch*, it is probable that the word is after all only विक्रमचन्द्रः *Vikrama Chandra:* and we must not allow our sanguine imagination to rejoice in having at length hit upon a veritable coin of the author of the *Samvat* era; against which there is also a cogent chronological obstacle, in the date hitherto assigned to our dynasty of *Guptas**.

Fig. 9 (Tr.) is introduced as a new variety of the *Chandra-gupta* coinage: only differing from the numerous class before described in the legends, which are very clearly on the *obverse*, श्रीचन्द्रगुप्तः. . . . *Srí Chandra-gupta*, (the titles not legible,) and on the *reverse* श्रीविक्रमः *Srí Vikrama*.

Fig. 10, of Mr. TREGEAR's collection, was engraved as a doubtful name, but I think it may be set down as belonging to SKANDA-GUPTA.

Figs. 11 to 15. This curious class of copper coins has not yet been brought to notice. They are indeed much more scarce than the gold coins of the same age, and hitherto only those of one individual

* Mr. TREGEAR has since written that on re-examination the word is palpably *Vikramaditya*.

of the family have been met with. It was not until Mr. TREGEAR's highly curious specimen, fig. 11, had furnished us with the style of CHANDRA's copper coins that we were led to re-examine our several collections, in which were found, and became legible, a few rare specimens of the same character.

Fig. 11 has the portrait of the Rája on one side, with a smaller, perhaps female, figure on his left hand. On the reverse a front face of him is presented, leaning, as it were, on a window sill: below which in very well defined characters, ... महाराज श्रीचन्द्रगुप्तः *(Srí ma) hárája Srí Chandra-gupta.*

Fig. 12 is a demi-coin of similar stamp, one of two belonging also to Mr. TREGEAR: but on the reverse of this, as in all that follow, the device, is a bird, the same that figures on the military standard of the gold coins, and which Mr. WILSON says "looks more like a goose than a Roman eagle." The inscription is very well preserved, श्रीचन्द्रगुप्त *Srí Chandra-gupta.*

Fig. 13 is from Col. STACY's cabinet: the obverse, well executed, represents the bust of the Rája holding a flower; beneath, श्रीविक्रम. . *Srí Vikrama;* the next letter may be च or म; but on the reverse are distinguishable the initial letters श्रीच. . *Sri Cha. . . .* proving that the coin belongs to CHANDRA-GUPTA.

Fig. 14 is from Col. SWINEY's cabinet, in all respects a duplicate of the last, but the reverse legend is even more distinctly चन्द्रगुप्त the lower part of the *ndra* only is effaced.

Fig. 15 had escaped notice in my own cabinet:—the head is more highly finished than in the other specimens, but the legend could not have been understood without their aid:—it is न्द्रगुप्त. . . . *ndra-gupta.*

Before quitting this very interesting group of coins, I must not omit to notice the only silver specimen which has yet come under my observation: it belongs to Dr. SWINEY, and is a forgery!—not a modern one, but an actual false coin of the period when it was struck. It is of copper thickly plated, but the silver plate is worn through in several places, exposing the interior nucleus. I have depicted it in Plate XXXIX. Fig. 21.

Obverse, the Rája in the original sacrificing attitude; under his left arm the letters अजय *Ajaya* or राजय *Rája y. . .*

Reverse. Goddess (Durga?) seated in the native fashion with cornucopia (or flower) and glory—a small elephant with trunk uplifted for protection, on her right shoulder. The marginal inscription श्रीप्रकणैा. *Sri Prakanau* the last letter may be double *n*,—but in neither manner does it present an intelligible word.

Second Series of imitations.

We now pass to another series of coins evidently descended from the same '*Ardokro*' type coin to which the early Canouj group has been so satisfactorily traced. In the latter case we have seen that the Hindu artists soon quitted their original, and exercised a fertile invention in varying the device during several generations of princes: but in the coins we have now to notice, no claims to ingenuity can be advanced; unless it be for gradually barbarizing and disguising the original type, so that it would have been absolutely impossible to recognize the character of the extraordinary symbols on the later pieces, had we not a numerous train of specimens to produce, in evidence of the gradual deterioration. I had already more than once engraved specimens of this curious series, thinking them to be merely the link coins between the *Rao nano rao* and the early Canouj series. Among the Manikyála coins was the only silver coin of the set on which I had particularly remarked legible Sanscrit characters; which were of a form and age differing essentially from the Canouj coin alphabet (so called). But now through Capt. Cunningham's careful scrutiny of all our available collections, I am enabled to produce a host of variable legends, which may be the means of developing by and bye a second royal dynasty of some other Indian locality, as successfully as has been the case with the Gupta family.

Henceforward my readers should understand, and they will, doubtless, soon perceive the fact, that my coin essays are joint productions, and that I have an auxiliary at my elbow, far better acquainted with the contents of, I may say, all the collections of coins in India, than I have leisure to become. With his zealous aid in hunting out the unpublished varieties of every class, I hope to make these notices complete as far as discovery has yet proceeded, and to do fuller justice to the numerous contributions I continue to receive from my numismatic co-adjutors in the interior.

That the present class is totally distinct from the last, may be argued on many grounds:—those are discovered in greatest quantity at *Canouj*, *Jonpur*, *Gaya*, and even occasionally in Bengal,—these are chiefly met with in Upper India, and in the *Panjáb*. Capt. Cautley has sent me one dug up in the foundations of his residence near *Seharanpur*; Mr. Dean dug up some at *Samehana* near *Delhi*:—but the most important fact in their history is the extraction of one of the lowest members of the group from the Manikyála tope by General Ventura. Mr. Masson's large collection in *Afghánistán* does not contain one of this type, nor any of the first or Canouj series. They are, therefore, purely of Indian growth. To Upper India, the *Panjáb*

or *Cashmir*, then we must turn our view in seeking the focus whence they were issued, and fortunately we have authentic lists of the sovereigns of some of these places to consult.

But first to enumerate the coins :—

Fig. 18. A gold coin (Stacy) weight 120 grs.* deserves to be mentioned first, because the workmanship is nearest in perfection—in *imperfection* we might rather say,—to the '*nano rao*,' or '*Ardokro*' original. The legs of the couch, cornucopia, and drapery, are well defined. The rája on the obverse has his trident standard, and his right hand outstretched as over the fire altar, but the altar is omitted. Under the right hand of the rája, both in this coin and in figs. 16 and 20, occur the letters प्स *pasa* either side by side as in 16, or superposed as in 20. Under the left arm, which is elevated to hold a spear, is another perpendicular combination of two or three consonants, apparently स क, and ट् with the vowel ए *e*. The same monogram (or rather polygram) continues through the whole series. I formerly took it for a sword handle, which it exactly resembles when the lowermost letter is hid.

Fig. 20. (Stacy) the next best in execution, has the letters श्रीक्ष *Sri Kri*.... visible on the left of the female.

Fig. 19. (Tregear :—duplicate, Cunningham) continues the word ; क्षगोधाय *Krigodháya ?* or *Kribhodháya*.

Figs. 16 and 17 of my cabinet have the letters श्रीविश्व.... *Srí Visva*.... or *Vikha* on the former, and पसल.... *Pasala*... (or perhaps *Visala ?)* on the latter.

Numerous other specimens in gold might be enumerated,—but they generally contain even less satisfactory fragments of names than the above. All that can be positively asserted is that the letters are Sanscrit, and, on these at least, of the same alphabet as that we have designated No. 2 of the *Allahabad* láth.

The silver coins of this second series are much more scarce than the gold and copper ones.—The three I possess, represented in figs. 1, 2, and 3, appear also to be of a very debased standard, and to belong to a much later period. None of them retain more than the rudest semblance of the rája figure—and still less of the goddess ;—the latter has even been taken for a dagger, the former for a scorpion ! The letters also are of a more modern formation, not differing much from those of the tenth century, found at *Sárnáth* and other places. Captain Cunningham first pointed out to me the words श्रीप्रताप *Srí Pratápa*.... on figs. 1 and 2.

* The weight of all these coins is nearly the same, being in fact the didrachma of the Greeks.

Plate XXXIX.

On *fig.* 3, on a former occasion I had already read श्रीयग.... *Srí Yag.*. but as there are traces of a cross-line to the loop of the third letter, I am inclined to adopt rather the reading यश.... *Yasa*.... *Yasa* glory, forming in composition many Indian names, as *Yasa Vigraha, Yas o Varma, Yas o Pála, Yaswant*, &c.

The two earliest specimens of the copper series, figs. 4 and 5, are from Col. Stacy's and Capt. Cunningham's cabinets respectively. The first has several letters of the old character:—under the left arm perpendicularly सयध.. *Sayadha*, and on the exterior मक.. *maka*.

Fig. 5 is, in reality, a forgery of a gold coin: the remains of the ancient gilding are still perceptible in the angles. The monogram is the same as in fig. 18, of the last Plate.

Figs. 8 and 9 are selected from Col. Stacy's box as examples of the name of श्रीप्रताप, *Srí Pratápa*, in the two forms of alphabet.—Probably they belong to different individuals of the same family name.

Fig. 8, is a valuable unique in Col. Swiney's drawers, with a multitude of letters that have usurped the natural position of arms, cornucopia, throne, and all such appurtenances!—On the obverse are the letters जय *jaya:* on the opposite face, श्रीविनद *Srí Vinada* or विरव *Virava*.. and to the right म (?) न्देद *mandèd*....

Fig. 9. The word *Srí* is still perceptible.

Fig. 10 is but introduced (from my collection) to shew the complete barbarism that finally prevailed. Such rude pieces are to be had in plenty, for one that contains a trace of writing. *Pratápa* is the commonest name on those that are by any means legible.

Third Series of imitations.

The next five coins of my Plate represent a very numerous class of Hindu coins, grotesque but very bold in execution, and attempting refinement in the position of the right hand of the rája, and in the sitting posture of the reverse. Having pointed out the prototype of the European coat, pantaloons, gaiter and wig on one series, I must not pass unheeded the *epaulette* so faithfully and curiously portrayed on the obverses of this series! I am induced to consider them a third instance of imitation of the *Ardokro* type from their general aspect and attitudes:—moreover the cornucopia is traceable in the earlier pieces as figs. 13 (Sta.) and 14 (J. P.) As they deteriorate, the limbs are lopped off as usual to make way for Nágarí characters! This is well exemplified in fig. 11 (Cunn.) and 12 (Sta.) Fig. 17 (Swi.) may be regarded as the ultimate degradation of the type.

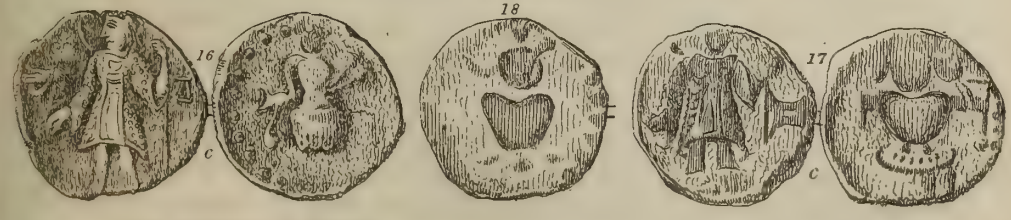
Second Series Continued.



Third Series, of imitations.



Fourth Series, of imitations



Deva dynasty of Canouj

See 1st Series.



Of legends we have in fig. 15, on the margin . . यो . . *yo* . . On fig. 16, reverse, the letter ज *ja*. On fig. 11, on either arm of the sitting figure श्रीदि *Srí di ?* and on fig. 12 several uncertain letters scattered about म य त य. In the last of the set, the letter ग stands alone.

It would be in vain to attempt any explanation of such vague symbols. Of this series of coins M. Court's drawings contained many good samples. They are plentiful in the *Panjab*, less so in Upper India, and comparatively rare in *Afghánistán*. Mr. Masson has only given one, and that very degraded.

Fourth Series.

These shadows of the *Kanerkan* king are alike Duncan's issue,—"a fourth ?—start eyes ! what will the line stretch out to the crack of doom ? another yet ?"—Such is, however, the singular fact; whether they "reigned in this kingdom" consecutively, or in subdivided portions of it, there can be no doubt of the common source whence these numerous progeny have borrowed their family features. Amid the hundreds of each kind, now open to our examination and selection, the progress of deviation can readily be followed: and it is not a little curious to see the different results of corruption arrived at by different engravers or moniers, in the course, perhaps, of a few generations. In one case we come to a kind of dagger—in another to a few dots and strokes—and in the present instance to a kind of heart, formed of the knees and petticoat of the seated female ! The best of the three coins depicted in the engraving are from Mohan La'l's collection; the worst from Capt. Cautley's disinterred *Behat* relics, where a large proportion of these *heart* coins was found in association with the supposed Buddhist coins, described in my essay of last November. I can find but one approach to a letter on any of them, viz. the वि to the left of the well formed Rája in fig. 16. It is hardly sufficient to confirm their Indian origin: and it must be noted that this species is found in abundance farther to the north-west than any of the others.

Thus Mr. Masson says of them: "this series is very extensively found in western *Afghánistán*. The *obverse* has a rude figure of the prince, clad in mail with the accompaniment of the fire altar," (not visible in ours, but clearly so in M.'s drawings) "and on the reverse a figure seated on a throne with her foot on a footstool. On no one coin of the class have I been able to detect the legend, although they appear in some instances to have had characters intended for such. Figs. 61 to 63," (those that shew the chair, the cornucopia and noose) "are generally found at *Beghram*, figs. 64 to 66," (those having only the outline of a heart,) "are the types prevalent

on the banks of the Indus and in the *Panjáb*,"—and, as we have stated above, near *Seharanpur* in India proper. This series has, undoubtedly, a better claim to be considered the genuine descendant of the *Ardokro* coin *in situ* than any of the three preceding series.

To sum up my review of these coins, I cannot help remarking how great an analogy exists between the circumstance of these several adoptions by subordinate imitators, of a predominant form of coinage that had perhaps prevailed for centuries under a paramount rule; and the nearly parallel case of the Sha'h A'lam coinage of the last century, the very words and form of which were copied by the numerous rájas and nawábs, who assumed the privilege of coinage upon the dismemberment of the *Delhi* monarchy. In many places, a few years only, have sufficed so to disfigure the Persian letters, as to render them quite illegible and barbarous.

Pala or Déva dynasty of Canouj.

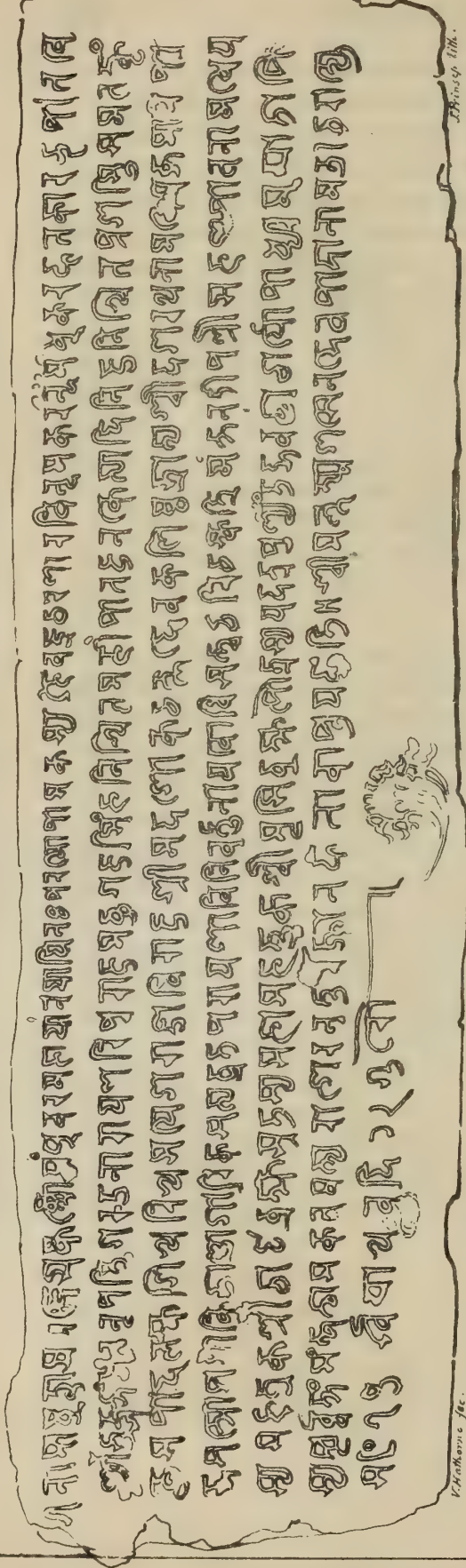
By way of filling the plate, I have engraved at foot, two new specimens of this dynasty, brought to light since the publication of Plate L. Vol. IV.

Fig. 19 is taken from a cast of a gold coin, in Col. T. P. Smith's possession. Some of the letters are new in form, but they may possibly be read श्रीमद्विग्रह पालदेव *Srí mad Vigrahapála deva.*

Fig. 20 is an unique copper coin of Capt. Cunningham's. On the obverse, the four-handed god is crushing a demon—instead of being seated in the usual serene attitude. The legend on the other side may be read, श्रीमत्पृथ्वीदेव *Srí mat Prithí deva,* a name occurring in the *Delhí* list as having reigned at *Lahore* A. D. 1176—1192: but not to be found among the many names which inscriptions have given us of the *Bhupála* family of Canouj and Benares.

Mr. Masson has figured a third new name of the same group, which I have inadvertently neglected to introduce in this plate as I had intended. The letters that are visible are श्रीम.... मीरमरस .. देव *Srí ma.... míramas.. deva.* The first and last letters are half cut off, and the vowel may be an *á*, so that the reading may possibly be *Srí m(at Ku)mára mah(á Rája) deva.* Mr. Masson says that "at *Kábul* coins of this peculiar type are met with occasionally in the bazar, generally of gold. A large parcel was dug up out of the soil, three or four years ago, near *Korinder* a village of *Kohdaman.*" He places them as the last of the Indo-Scythic series, not having, at the time of writing, seen what had been made of them here. If indeed the sitting female be a far descendant from the Mithraic goddess, the long interval of six or eight centuries will fully account for the magnitude of her transformation.

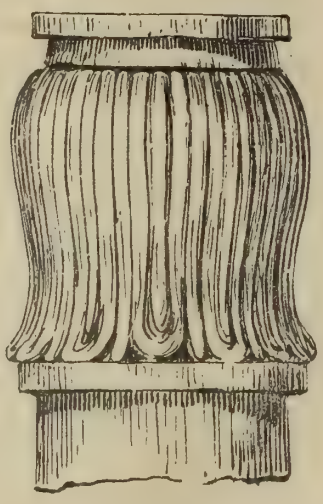
FACSIMILE of an INSCRIPTION at Buddha-Gaya. taken in 1835.

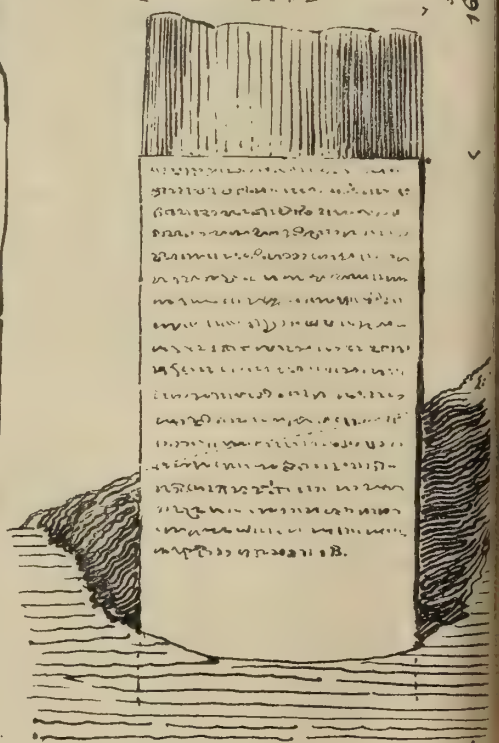


V. Hawkins fec. J.P. lith.

Elevation of the
LATH
at Bihtarí, Ghazipur.

(for inscription, see Pl. XXXII.)





A Cunningham del J.P. lith.

Printed at the Oriental Lith^c Press. Calcutta.

It is a great pity that the horde discovered at *Korinder* was not secured at once. It might have contributed very materially to our classification of this second *Canouj* dynasty. A great many specimens of the same sort must also be scattered about in the cabinets of retired Indians at home; and we may hope now that Professor WILSON has commenced upon the task of examining the coins in the Royal Asiatic Society and India House collections, specimens will flow in to him from all quarters to be decyphered and described.

V.—*Facsimiles of various Ancient Inscriptions, lithographed by* JAMES PRINSEP, *Secretary As. Soc. &c.*

[Continued from page 561.]

Inscriptions from Buddha-Gaya, Plate XXX.

The neighbourhood of *Gaya* has long been known to be prolific of inscriptions:—yet, notwithstanding the various notices of them which have appeared in the Researches, of the Bengal, and of the London Societies, the theme is, as yet, by no means exhausted. Mr. HARINGTON furnished our Society at a very early period after its institution with copies of two inscriptions from the principal cave, lying in the hill of *Nagarjuna*, (the name, it will be remembered, of a celebrated Buddhist patriarch,) one of which was decyphered by Dr. WILKINS, and proved to be a record of the excavation of the cave by ANANTA VARMA, the grandson of YAGNA VARMA. The date is not given, but the character (No. 2 of the *Allahabad láth)* shews it to belong to an early century of the Christian era. Mr. HARINGTON mentions several other caves and inscriptions which have not yet been examined.

Dr. WILKINS also translated one inscription copied from a stone by Mr. WILMOT in 1785, (As. Res. vol. i. 284,) dated Samvat 1005, purporting that AMARA DEVA, the author of the *Amera kosha*, built the temple of Buddha at *Buddha-gaya*.

Dr. HAMILTON (Roy. As. Soc. Trans. vol. ii. 44,) in his account of the ruins of Buddha Gaya, alludes cursorily to inscriptions on two images of *Gautama*, recording their erection, one by JAYA SEN and KUMA'RA SEN, sons of PUNYABHADRA, son of SAMANTA, all untitled persons: the other by Rája VIJYABHADRA, of whom nothing more is known.

The Burmese inscription found by the Embassy in 1831, was of a more interesting description. It is described in the Journal (vol. iii. page 214), and more fully by Colonel BURNEY in the last volume of the Researches. It was upon the occasion of my requesting Mr. HATHORNE, then magistrate of *Gaya*, to take a duplicate of the Bur-

mese facsimile, that this gentleman went beyond his commission, and kindly furnished me with facsimiles of several other inscriptions in the neighbourhood of the ancient temple, all of which, he says, are quite illegible to the learned pandits of *Gaya*.

"No. 2, (No. 1 being the Burmese inscription) he writes, is on a stone lying near the *Mahá Buddha* temple." A copy of this, noted by HAMILTON as 'an inscription of considerable length,' appears to be deposited in the E. I. C.'s Museum, labelled No. 113, but no further account of it is furnished. It is this inscription which I have lithographed in Plate XXX; but before proceeding to its discussion, it will be better to notice the other items of Mr. HATHORNE's dispatch.

"No. 3 is an inscription on a stone, inserted in the wall of a Brahman's house erected on the site of the old fort, said to have belonged to Rája AMI'R SINH, who went over to the Burman empire, became converted to the Bauddha faith, and died in that country." This is evidently the inscription translated by WILKINS; the Rája AMI'R being the AMARA above mentioned, : and the story of his conversion has merely been altered a little in repetition, and mixed up with the more recent collisions between the Burmese defendants of the shrine and the Rajput expeditions against these infidels in the 12th and 13th centuries. Perhaps the similarity of the name to the celebrated HAMI'RA SINH of *Chitor* may have helped to confound the tradition. It is unnecessary to republish this inscription.

"No. 4 is inscribed in a circular form over an image of *Devi* in the *Mahant's* garden." This, again, is alluded to by Dr. HAMILTON as No. 99 of the India House museum, "on a *male* figure now called *Saraswatí* (a goddess), is the usual pious sentence of the Buddhist." It is useless to lithograph this inscription, which does not differ even in the form of the letters from the "*Yè dharma hetu*, &c." of the *Sárnáth* and *Tirhut* images.

"No. 5 is a word engraved on a pillar which now forms one of the stanchions to an upper story in the convent. The character you will observe assimilates to the ancient inscriptions." This I have found room to insert in Plate XXXIII., but it is impossible to make any thing of it: perhaps it formed part of a longer inscription in the oldest láth character.

No. 2, then, is the only one of the series which requires further observation. From my acquired experience in such matters, there was little difficulty in transcribing the whole from the facsimile (lithographed on a reduced scale in Plate XXX.) into the modern Nágarí, nor in preparing a translation with the assistance of the Society's pandit, and of RATNA PAULA, whose acquaintance with the Buddhist

tenets enabled him to correct the former in several doubtful readings.

The character may be properly designated as the *Gaur* alphabet, the parent of the modern *Bengálí* form. The specimen is chronologically valuable to the investigation of the gradual alterations it has undergone, because it contains a date, *Samvat* 73 or 74, of an era that has been the subject of some misapprehension. Mr. Colebrooke rectified Dr. Wilkins' mistake in supposing this *sambat* could refer to the era of Vikramáditya, and assumed a position for it 1000 years more modern, in connection with the *Gopala* or *Bhupála* dynasty of *Gaur*. The document before us corroborates this view ; but by the expression, " after the expiration of the reign of Laxmana Se'na," it would seem that the term *samvat* applied generally to whatever epoch might be mentioned in the preceding sentence. Laxmana Se'na, the son of Belal Sen, who built the city of *Gaur*, reigned in A. D. 1116—1123 : so that the date of the inscription on this supposition would be A. D. 1197, only three years prior to the destruction of the monarchy by the Musalmans. The figures, however, are unfortunately doubtful, just where their identification is of the greatest consequence :—the first might be read as the Nágarí 1, were not the numerals of the month so clearly of the Bengálí form. If counted from the foundation of *Gaur* in 1066, the date would fall in 1140. Were there any possibility of assuming a starting point on satisfactory data, the day of the week, Thursday, would afford a sure test of its being correctly fixed, by the calculation of the luni-solar period elapsed : but according to the formula in my calendric tables, neither of the epochs above selected will bring about such a result.

The following is the transcript of the facsimile in modern Nágarí. One letter after *Namobuddháya* is illegible, and the next word is consequently doubtful : *anusvara* is substituted for ङ.

नमो बुद्धाय संकल्पोयं प्रवरमहावीरस्वामिनः परमोपासकस्य दैवज्ञचरणारविन्द मकरन्दमधुकरहलकारभूपालवंशोत्पन्न क्षणदपतिगरुडनारायणरिपुराजमत्तगज सिंहनिखिलमहीपालजनकेत्यादिनिजनिखिलप्रशस्तिसमलंकृतं सपादलक्षशिखरि खसमेण राजाधिराजश्रीमदशोकचन्द्रदेवकलिङ्गाद्यश्रीदशरथनामधेयकुमारपादप द्मोपजीवि भाण्डागारिकसत्यव्रतपरायणा विनिवर्त्तनीयवोधिसत्वचरितस्त्रि स्वकुल दीपश्रीसहसपात्नामधेयस्य महात्मकश्रीचाटब्रह्मसुतस्यमहामहात्मकश्रीमहिब्रह्मपौत्र स्यमहत्वपुणं तद्भट्टाचार्य्योपाध्यायमातापितृपूर्व्वाङ्गसङ्गतासकलपुण्यराशिरनन्तवि ज्ञानफलावाप्तयदृति श्रीमल्लक्षणसेनदेवपादानामतीतराज्ये

सं ७४ वैशाख वदि १२ गुरौ

Translation.

"Salutation to *Buddha.*—May this votive aspiration of the devoted votary to *Mahávira Swámi**—(Of him who is) in holiness like the blue-bee steeped in the honied lotus of the feet of a divine personage, and in might like the lion triumphant over the infuriate elephant, who reigns over the royal and puissant progeny of Hulkara Bhupa'la, named Krishna Nripati and Garudana'rayana, his inveterate antagonists—who is himself the gracious father (protector) of tributary kings—who, adorned with such might and virtues, sways the imperial sceptre over 125000 kingdoms well people with mountaineer warriors—the king of kings—the auspicious and high in dignity Asoka Chandra Deva,—(of the aforesaid Rája's) younger brother, Dasaratha Kuma'ra, supported and maintained through the lotus of his gracious feet, his dependent treasurer, a conscientious Bodhisatwa —the light of his tribe and family, by name Sahasrapa'da, son of the dignified Sri' Cha'ta Brahma, and grandson of Mrishi Brahma —may (this his holy act), united with the virtues of his teachers and *guru*, his mother and father, enable to attain the fruit of immortal wisdom, salvation from passions and delusions of sublunary existence, and absorption of his soul in the Supreme Being."

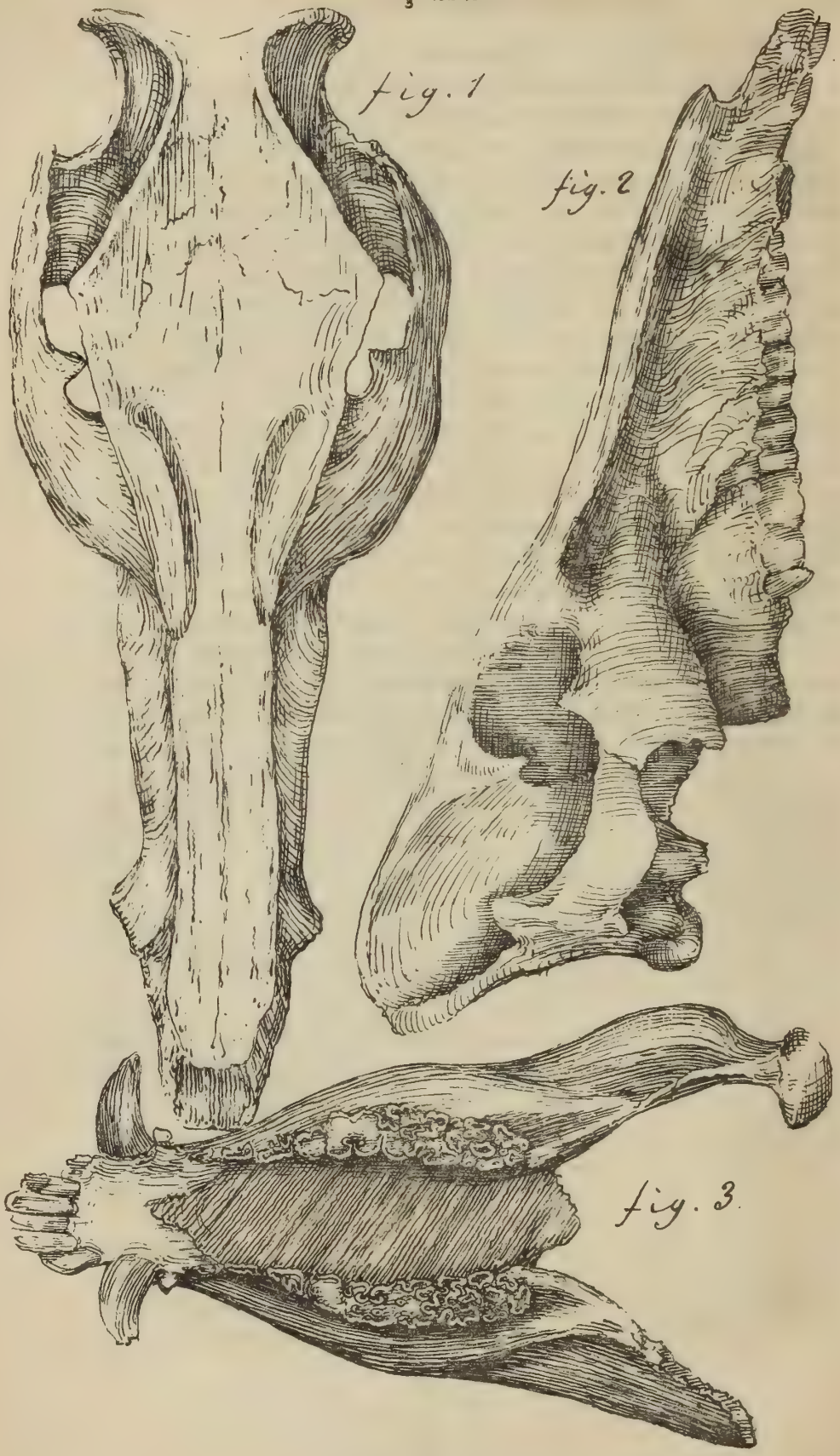
"Written after the conclusion of the reign of *Srí mat* Laxmana Sena Deva, in the year 74, on Thursday, the 12th day of the dark half of the month of *Vaisakha.*"

The inversion of the sentence, and the multitude of epithets applied to each party, makes it difficult for an English reader to follow the sense through such a labyrinth :—in a few words, it prays that some good act (probably the building or endowment of a temple) may redound to the eternal welfare of one Sahasrapa'da, the treasurer of Dasaratha Kuma'ra, the younger brother of Maharája Asoka Chandra Deva, the reigning prince of a dynasty that had supplanted by conquest some descendants of the Bhupala family, (of *Gaur* doubtless,) by name Krishna and Garudana'ra'yan. All these names and persons I believe are new to history : at least I find no Asoka among the successors of Bela'l Se'n. From his assumption of such a name it may be presumed that he was of the Buddhist faith, as the invocation shews to have been the case also with his officers of state.

* Buddha, the transcendently victorious hero. The construction of the sentence, which it is endeavoured to follow closely, will be hardly intelligible without explaining that this first epithet belongs to Sahasrapa'da, whose name occurs lower down.

Sub Himalayan Fossil Remains. Sus.

$\frac{1}{3}$ nat. Size.



Printed at the Oriental Lith.c Press. Calcutta.

Bhitari Láth.

On the same plate I have lithographed from a drawing by Captain Cunningham an elevation of the *Bhitari láth* in the *Ghazipur* district, of which so much have been said. It was Mr. Tregear who first brought it to notice in 1834; he sent me a rough pencil sketch, and promised further examination. This was accomplished in company with Captain Cunningham; when on clearing away the earth from the lower part of the shaft a long inscription was discovered. It was immediately seen to be in the same character as No. 2 of the *Allahabad láth*—and while taking a copy of it in pencil, the names of Rájas Sri' Gupta, Ghatot kacha, Chandra-gupta, Samudra-gupta, were found following in succession, exactly as on the *Allahabad* inscription—other names, Chandra-gupta, Kuma'ra-gupta, and Skanda-gupta, succeeded; proving that this pillar had been erected several reigns subsequently to the other, and confirming in an extraordinary manner the concatenation of the *Canouj* coins of this very Gupta family, as has been noticed in a preceding paper.—More need not be said at present, as the inscription itself will appear next month with Dr. Mill's interpretation and valuable comments.

There are two other pillars near *Ghazipur*, at *Zamineah*, south of the *Ganges*, from which great expectations were entertained, of our making a further acquisition—but we have just been disappointed. Col. Povoleri writes me, that Mr. Murray has closely examined the principal pillar without finding any trace of writing on it; he is about to dig around it, however, for the square portion of the shaft may possibly be buried below the soil. This is our only chance.

VI.—*Sub-Himálayan Fossil Remains of the Dádupúr Collection.* By *Lieuts.* W. E. Baker *and* H. M. Durand, *Engineers.*

Genus Sus*.

Cuvier has confined his remarks upon the fossil remains of the genus *Sus* to a brief notice of their existence, in consequence, it appears, of the fact that up to the time at which the *Recherches sur les Ossemens fossiles* were published, the instances of the occurrence of fossils of this genus were rare; and of the small number discovered the greater portion had been found in peat. The tables given in the

* The Plates B and C mentioned in the ensuing descriptions, have been incorporated in Plate XLIV., and had been reserved for the Researches, on account of their dimensions; but we see they are necessary to the article, and have inserted them with Col. Colvin's lithograph.—Ed.

latest geological manuals show, that in the interval which has elapsed since the publication of Cuvier's work a few sites have afforded specimens, but still the remains in comparison with those of other genera are far from being abundant. By reference to the table of Sub-Himálayan fossil genera in the 53rd No. of the Journal of the Asiatic Society it will be observed, that, although here found in greater quantity than in European localities, the relics of the genus are, in comparison with those of most of the other Pachydermata, scarce. Notwithstanding their small number, the specimens in our possession, happening in general to be tolerably perfect, form a series which, though not continuous, is sufficiently perfect to illustrate the dentition of one of the species.

To the consideration of this species we without further introduction proceed; premising only, that with the exception of the cranium of which fig. 6, Pl. B, is a representation, the whole of the specimens referred to are from the *Maginand* deposit, a general description of which prefaces our notes on the fossil unicorn-rhinoceros.

Cranium. The fossil, of which figs. 1 and 2, Pl. XXXIV. are representations, is the cranium of the sow of the species to be described. The specimen has been less crushed than is usual, but has not altogether escaped. The nasal bones are not quite centrical, and in their natural position, being thrust over towards the left maxillary by a crush which acted on the right side of the head. The mastoid apophyses and the descending tubercles in their front are broken off; the extremities of the pterygoid apophysis are also mutilated:—the zygomatic apophysis of the temporal, if perfect, cannot be cleared completely from the matrix which adheres to it, without the risk of destroying the process itself and the adjacent parts: both jugals are imperfect, being broken off (as shewn in the profile view of the skull) immediately after their descent from forming the post. orbitary apophysis: the canines are wanting, but their alveoli are very distinct, though small for the size of the head; this circumstance, in conjunction with the minor development of some parts of the occiput when compared with other specimens, indicates the sex of the cranium.

With the view of obtaining the difference of proportions consequent on differences of sex, the measurements which form the third column of the subjoined table were inserted; the half palate of the cranium from whence they are derived is given at fig. 5, Pl. B, but the occiput and nasal bones being imperfect, it was not deemed necessary to delineate the specimen either in plan or profile.

The second column of the table is occupied by the proportions deduced from the dimensions taken upon the cranium of the sow; and

the first column by those obtained from the head of a wild boar killed in the neighbourhood of *Hansi*. These two skulls denote, by the state of their molar teeth, very similar ages, the existing being but little younger than the fossil species; they are therefore well adapted for a comparison.

	Existing species.	Fossil species, Female.	Fossil species, Male.
Space occupied by seven molars measured on mesial lines,	1,000	1,000	1,000
From lower edge of foramen magnum to extremity of intermaxillary,	2,672	2,586	..
Space between the 9th molars at their anterior,	0,210	0,193	0,257
Ditto ditto 1st ditto,	0,371	0,356	0,418
Distance from 1st molars to extremity of intermaxillary,	0,858	0,680	..
Ditto from lower edge of occipital foramen to posterior edge of 7th molars,	0,825	0,922	..
Ditto from summit of occiput to extremity of intermaxillary,	3,267	2,940	..
Breadth of frontal plane at post. orbitary apophysis,	0,876	0,831	0,928
Ditto of parietal plane at narrowest part,	0,358	0,241	0,301
Greatest breadth across zygomatic process of temporal bones,	1,323	1,280	..
From anterior of orbit to extremity of intermaxillary,	2,079	1,934	..
From anterior of orbit to point of post. orbitary apophysis,	0,362	0,317	..
Diameter of orbit perpendicularly to line of molar,	0,365	0,280	0,290
From point of post. orbitary apophysis to lower edge of jugal,	0,562	0,553	..
Height of occiput from lower edge of occipital foramen to summit,	1,073	0,893	..
Breadth across occipital condyles,	0,487	0,449	..

Having only one specimen of the existing species, we shall draw no conclusions from the difference of size observable in the two species, as shown by the table of dimensions which closes this paper; but, confining ourselves to the discordances displayed by the above table, in which the length of space occupied by the seven molars is chosen as the unit of comparison, shall notice the following circumstances.

The molars with reference to the length of the head as measured from the foramen magnum to the extremity of the intermaxillaries, occupy more space, and are situated at a greater distance from the foramen magnum; there is, consequently, a less interval between the anterior false molar and the extremity of the intermaxillaries in the fossil than in the existing species: the palate is also somewhat narrower.

The mesial line of the occiput is in the fossil nearly perpendicular to the plane of the palate, agreeing in this respect with the cranium of the hog which forms the subject of Cuvier's description: but in the wild hog of *Hariánah* this mesial line makes an obtuse angle with the palatal plane; thus causing the dimension from the crest of

the occiput to the anterior extremity of the intermaxillaries to be proportionately greater than in the fossil.

It will be observed, that the male, with exactly the same space occupied by its molars as by those of the sow, has a greater frontal and parietal breadth of upper plane of the head. In both fossils there is, in the frontal plane, a total absence of convexity: as this plane ascends, there is a tendency to concavity, in consequence of the parietal crests being more strongly marked than in the existing species, and thus producing the appearance of a gentle hollow where in the common wild hog there would be a gentle swell.

The orbits are in the fossil proportionately less, situated higher, and more forward in the head; their horizontal is greater than their perpendicular diameter, whereas in the existing species these are nearly equal: the post. orbital apophyses of the frontals are not so salient, and those of the jugal bones are less distant from the anterior of the orbit than is the case in the existing species.

Considering the sex of the fossil cranium, the saliency of the zygomatic arches correspond in the two species.

On reference to the table of measurements, it will be seen that the occiput of the specimen third in the table is, in consequence of having belonged to a male, larger than that of fig. 1, Plate XXXIV. The specimen here alluded to possessing only one molar, could not be introduced into the foregoing table of proportions: supposing, however, the space occupied by its molars to have been equal to that of fig. 1, Plate XXXIV. and fig. 5, Plate B, the height of this occiput yields a proportion of 1.071, which is very similar to that obtained for the existing species. The breadth across the condyles is comparatively less in the fossil; but the transverse breadth of the occiput at the broadest part is more developed than in the existing species.

No sutures can be traced in the fossils. From the foregoing remarks it is evident that in several respects the species differ. We shall now proceed to examine the dentition, which presents a few modifications worthy of notice.

Upper jaws. The plane of the palate extends backwards behind the seventh molars, even further than in the common hog.

The teeth correspond in number with those of the existing species, the incisors being $\frac{6}{6}$ canines $\frac{1}{1}$—$\frac{1}{1}$, molars $\frac{7}{7}$—$\frac{7}{7}$.

With exemplars of the earlier stages of the dentition in the upper maxillaries, we are not well provided: a small fragment containing the 3rd and 4th molars but slightly worn, shows that the 4th milk tooth resembled that delineated by Cuvier in his Plate 1, fig. 6; but the 3rd molar, though composed of similar parts, is a little longer

Plate B.




fig 1
fig 2
fig 3
fig 4
fig 5
fig 6

and more tapering than the one in fig. 6. Between this the initial step in the dentition, and that in which the 6th molar is making its appearance, we have none of the intervening stages. A cranium which has not been drawn in consequence of the mutilation of all the molars except the 5th, shows the 6th tooth in the act of cutting the jaw: the anterior extremity of the intermaxillary being broken off, the incisor teeth are not perfect, but by the fracture the permanent incisors are in part laid open, so that the milk ones must either have already fallen or have been on the point of so doing: the latter is the most probable, as the lower jaw of this cranium, of which fig. 2, Plate C, is a representation, has the first set of incisors still in the jaw, though much worn; of course the state of detrition of the molars of the upper corresponds with that of the teeth of the lower jaw; the 4th molars are very much worn, the 5th has commenced to be in use, and the 6th is showing the summits of its collines; it appears to be during the progressive wear of the 5th and the descent of the 6th molar that the milk teeth are shed and replaced by the permanent ones; for fig. 1, Plate B, which represents the right half of a specimen, has no vestige of the milk teeth, but shows the permanent molars Nos. 1, 2, 3, 4, and 6 unworn.

As the animal increased in age and the 7th molar gradually descended, the teeth already in use assumed the appearance exhibited by fig. 2, Plate B, which represents the left half of a fossil upper jaw: this and the foregoing specimen, fig. 1, show that the 1st, 2nd, 3rd, 4th, 5th, 6th molars, excepting in size, correspond with those of the existing species, each tooth being compounded of the same parts, even to the small external interstitial pillars of the 5th and 6th. The 7th is in fig. 2 quite untouched, only the anterior portion of the tooth having, in fact, been exposed; although in consequence of the breaking away of the posterior part of the specimen the whole of the molar is now exposed. Compared with a germ of the existing species, it is found to be composed of analogous parts, the general shape of the fossil tooth being at the same time modified in consequence of the greater size to which the posterior collines or mamillæ attain: hence the tooth is comparatively longer and less tapering.

Fig. 5, which represents the left half of a fossil cranium, shows the 7th molar in great part brought into use, and the corresponding progress in the detrition of the other teeth. In fig. 3, Plate B, which is a view of the left half of the palate of the cranium fig. 1, Plate XXXIV., the whole of the last molar has been brought into use. The 1st molars are in this specimen mutilated, the others evince the wear

due to a more advanced age than that to which the fossil fig. 5 had arrived.

Fig. 4 is the left half of a fossil cranium, in which the two rows of teeth have accidentally worn irregularly; the left side is given, being the one in which the enamel curves of the last molar have assumed forms which, on comparison with the foregoing specimens, will be found slightly to differ. The corresponding tooth in the right maxillary is both considerably longer than its fellow, and bears a greater similarity to those of the other skulls. The canines of the male were large and ribbed on the upper surface, but the fossil upper jaws presenting none perfect, their shape and direction are not ascertainable: a detached fragment indicates a wear similar to that which occurs in the tusk of the wild hog: from the lower jaws little can be deduced, fig. 3, Plate XXXIV., being the only adult one which possesses the canines perfect. This specimen would have accurately indicated the wear had it been possible to clear the canine of a thin hard coating of the matrix, which, though not sufficiently thick to affect the general shape of the tusk, conceals the worn, and does not allow it to be distinguished from the unworn, surface.

The canines of the female were small, as may be seen by the alveoli of fig. 3, Plate B.

The incisors in fig. 3, Plate B, are much used: only four are visible; the matrix, which cannot be altogether cleared from the anterior of the palate, probably conceals the alveoli of the posterior incisors.

Lower jaws. The early state of the milk teeth when the 4th or tripartitioned molars is commencing to be used, is exhibited in the fragment of which fig. 1, Plate C, is a representation; the 5th molar is also here seen prior to undergoing detrition.

The next stage exemplified by a specimen, is that in which the 5th is a little worn; the 3rd and 4th are a good deal so, and the 6th is just showing the tops of its collines; the central early incisors are much used, but not yet shed; the posterior ones are already replaced by their permanent successors, and the canine is showing its point: this jaw, as before remarked, was found together with its cranium.

By the time that the 5th molar is much used, and the 6th a little so, the milk teeth are all cast, and the permanent ones in use. Fig. 3, Plate C, exemplifies this step; here the 7th molar is half developed, the 2nd, 3rd, and 4th are slightly abraded; the canine, which is broken at the point, rises with a gentle divergence, and instead of the triangular section observable in the tusk of the existing species, has one nearly elliptical, being only somewhat flattened at its posterior edge.

The specimen, not coming from an adult animal, affords no trace of any friction having commenced to take place between the upper and lower canines, the latter being intact: in this respect the fossil corresponds with the existing species, in which, to judge from a skull in our possession, the canines do not meet until the development of the 7th molar. The posterior incisor is present in neither half of the jaw,—a circumstance which fig. 4 proves to be accidental, and that the shape of this incisor is peculiar and distinctive. The central incisors are large, and protrude more horizontally than in the existing species. The right side has been crushed towards the left side of the jaw, so that the angle formed by the two halves at their symphyses cannot, from this specimen, be ascertained.

Fig. 5 is a fragment in which the 7th molar is nearly clear of the jaw, and has its anterior portion a little worn, but the central and posterior parts untouched. Nos. 3, 4, 5, and 6 are of course in a more advanced state of detrition than is the case with those of fig. 3.

The next condition illustrated is that in which the 7th molar is completely developed from the maxillary and in use; No. 6 is much worn, No. 5 nearly obliterated, and Nos. 2, 3, 4, and even No. 1, are in progressive wear. Fig. 4, which illustrates this state of the teeth, is from a nearly perfect fossil jaw; the specimen has lost the left condyle, and has the parts adjacent to the right one broken off, as shown in the profile view fig. 6; the left canine is snapped off close by the bone, and thus presents a sectional view: the left hind incisor, though not actually affixed to the specimen, was found in the same block,—a fact which in connection with the general state of the specimens, argues quiet deposition.

The molars of the lower jaw, like those of the upper, bear a close resemblance to those of the existing species; the incisors and the canines are, as above noticed, distinctive; and by reference to the table of dimensions it will be seen that the symphysis is in the fossil shorter in comparison to the length of the jaw, and the angle formed by the two sides is also less acute than in the common wild hog.

From the form of the cranium, the shape of the canines and incisors, and the other points in which the fossil differs from the existing species of the country, a specific difference may be inferred; for the dissimilarity, although less than that which occurs between the *Babyrussa*, the *Larvatus* and the *Sus scrofa* or common hog, is too remarkable, particularly in the shape of the canines of the lower jaw, to admit of the fossil being considered as a mere variety of the *Sus scrofa*.

Besides the foregoing fossil species, the existence of another is indicated by a cranium, of which fig. 6, Plate B, represents the left half of the palate: the fossil is unfortunately imperfect; the molars of the right maxillary are all broken, and of those on the left side the 6th and 7th are alone perfect. These are smaller than the analogous molars of the former,—smaller even than those of the existing species, and also present other differences besides those of length and breadth: their detrition does not take place in the same manner; for the 8th molar is but little worn, notwithstanding that the 7th is fully developed; in the larger fossil species the 6th would have been much worn down. The 9th molar resembles in its tapering form that of the common hog, but is posteriorly much less complicated, fewer tubercles entering into its body; it is not in the fossil quite perfect, one of the anterior collines being broken off: there is, however, sufficient of the tooth to warrant these remarks. The 6th molar is composed of the same number of collines as that of the common hog, but these, as also the inner side of the tooth, generally are less channelled. The head appears to have been short, for the nasals gain breadth more rapidly as they ascend, and the anterior extremities of the channels from the foramina on the frontals are perpendicularly over the 3rd, instead of being over the anterior of the 6th molar, as in the *Sus scrofa*. The occiput being broken off, the length of the head can only be guessed by paying attention to these minor considerations.

The above specimen is the only one in our collection of this variety; we shall therefore content ourselves with noting its existence amongst the fossil species; and in the event of further discoveries adding to its exemplars, we shall recur to the subject.

Measurements of Lower Jaws.		Existing species.	Fossil, Fig. 4, Pl. C.	Fossil, Fig. 3, Pl. C.
Length from post. of ramus to anterior extremity of symphysis,.....		10,62	11,65	..
Ditto of symphysis on mesial line, ...		3,25	3,27	3,00
Space occupied by seven molars,.....		5,40	6,15	..
Molars measured along their centres,.....	1st.	0,30	0,35	0,35
	2nd.	0,41	0,52	0,50
	3rd.	0,48	0,57	0,62
	4th.	0,52	0,60	0,70
	5th.	0,51	0.50	0,71
	6th.	0,76	1,05	1,23
	7th.	1,53	1,94	..
Greatest breadth,	1st.	0,13	0,21	0,20
	2nd.	0,18	0,27	0,27
	3rd.	0,27	0,33	0,36
	4th.	0,36	0,45	0,51
	5th.	0,47	0,57	0,54
	6th.	0,60	0,69	0,72
	7th.	0,66	0,76	..

Table of Dimensions.

Measurements of the Cranium.		Existing species.	Fossil, Fig. 1, Pl. 34.	Fossil not drawn.	Fossil, Fig. 5, Pl. B.	Fossil, Fig. 1, Pl. B.	Fossil, Fig. 2, Pl. B.	Fossil, Fig. 6, Pl. B.
		In.	In.	In.	In.	In.	In.	In.
Space occupied by the 7 molars, taken on mesial line,		4,52	5,17	..	5,17	..	..	..
From lower edge of foramen magnum to anterior extremity of intermaxillary,		12,08	13,37	..	..	..	..	..
Space between 7th molars at their anterior,		0,95	1,00	1,06	1,33	.	..	..
Ditto ditto, 1st ditto,		1,68	1,84	..	2,16	..	..	..
Distance from 1st molars to anterior extremity of intermaxillary, taken on mesial line,		3,88	3,52	..	..	..	..	..
Ditto from lower edge of occipital foramen to posterior edge of 7th molars ditto,		3,73	4,77	4,60	..	..	..	..
Ditto from summit of occiput to extremity of intermaxillary,		14,77	15,20	..	..	..	..	..
Breadth of frontal plane at post orbitary apophysis,		3,96	4,30	4,80	4,80	..	..	..
Ditto of parietal upper plane at narrowest part,		1,62	1,25	2,00	1,55	..	..	..
Greatest breadth at zygomatic arches,		5,98	6,62	..	..	..	..	..
From anterior of orbit to extremity of intermaxillary,		9,40	10,00	..	..	..	..	..
From anterior of orbit to point of post. orbitary apophysis,		1,64	1,64	1,78	..	..	..	..
Diameter of orbit perpendicularly to palatal plane,		1,65	1,45	1,40	1,50	..	..	..
From point of post. orbitary apophysis to lower edge of jugal,		2,54	2,86	2,94	..	..	..	..
Height of occiput from lower edge of occipital foramen to summit,		4,85	4,62	5,54	..	..	..	..
Breadth across occipital condyles,		2,20	2,32	2,24	..	..	..	..
Length of molars measured along their centres,	1st.	0,34	0,30	..	0,36	0,40	..	..
	2nd.	0,43	0,47	..	0,43	0,49	0,52	..
	3rd.	0,44	0,47	..	0,45	0,54	0,52	0,41
	4th.	0,38	0,45	..	0,56	0,54	0,49	0,41
	5th.	0,61	0,52	..	1,35	0,80	0,74	0,51
	6th.	0,77	0,87	..		1,24	1,29	0,74
	7th.	1,45	1,97	2,03	2,04	..	2,03	1,02
Breadth of molars measured across anterior at base, on broadest parts,	1st.	0,21	0,27	..	Breadth cannot be accurately taken, enamel destroyed.	0,18	..	..
	2nd.	0,26	0,31	..		0,34	0,31	..
	3rd.	9,33	0,33	..		0,44	0,43	0,31
	4th.	0,54	0,55	..		0,54	0,60	0,48
	5th.	0,62	0,68	..		0,70	0,66	..
	6th.	0,76	0,85	..		0.80	0,84	0,61
	7th.	0,84	1,00	..		..	0,97	0,70

Reference to Plates.

Plate XXXIV.—Plan and profile views of fossil cranium, and plan view of a lower jaw.

Pl. XLIV. { B.—Series of half palates to illustrate dentition of upper jaws.
C.—Series of half and entire lower jaws.

VII.—*Note on the occurrence of Volcanic Scoria in the Southern Peninsula. By Lieut.* Newbold, *A. D. C.*

I have the honor to present to the notice of the Society, specimens of a calcareous and siliceous *scoria* forming the substance of a small hill at *Búdígúnta*, near *Courtney*, about 11 miles west of *Bellary*. This hill is situated close to the road, at the summit of a small pass over a range of hills running S.E. by which it is embosomed. Its apparent height is about 40 feet—circumference, 420 feet.

The summit is rounded, and surface partially covered with long dry grass; amid which project in every direction masses of *scoria*, passing round the hill in almost regular succession like steps. Towards the top the *scoriæ* appear to be more friable—the base is cavernous, and the masses more vitreous on their surface, and stalactitic in shape. The hill when struck by a heavy stone or the heel of a booted foot emitted a sound as if hollow. Similar sounds were produced in riding a horse over the base. I found two pieces of the *scoria* several hundred yards from the spot: it is, however, probable that these may have been conveyed thence by the traveller. On the summit I picked up a piece of *clink-stone* and one of hornblende rock: the latter appeared to have been excavated by art. Around the base masses of *scoria* intermixed with the schistose sandstone, greenstone, and quartz of the surrounding formation were strewn together, with fragments of trap and iron ore.

The bed of the rivulet that washes the foot of the pass I found to be composed of greenstone. A partial stratum of *kankar* is here met with, covered with alluvial soil.

The surrounding hills are greenstone slate, in which minute scales of mica are found disseminated, capped by a schistose sandstone. The mound of *scoria* has from a distance a singular cineritious appearance, strongly contrasted with the ferruginous tint of the surrounding hills. By many it has been thought of volcanic origin, but I could discover nothing like a crater; nor any traces of lava, obsidian, augite, olivine or other volcanic matter.

The oldest natives can give no account how these *scoriæ* were accumulated, beyond the vague tradition founded on an *episode* in the *Mahabhárat*, of their being the burnt bones of a *Racsása* of a former age (*Dwápar Yug*); nor am I aware that such *scoriæ* are produced by any furnace used in the country in present times.

Buchanan, in his geological account of the range of hills from *Rajmahal* to *Burdwan*, describes a calcareous matter, in mass, called *Asurhar*, or giant's bones.

The similarity in the names given by the natives to these two substances *(Racsása* also signifying a giant) has struck me; although BUCHANAN describes the *Rajmahal* formation as deposited from water; whereas the specimens now sent appear to have undergone the action of fire.

P. S. Since writing the above I have received a letter from the President of the Madras Hindu Literary Society, CAVELLY VENKATA LACHMI'A, who informs me that there are mounds of *scoriæ* of a similar description at *Búdibetta* near *Chittledrúg*, at *Búdihal*, in the *Mysore* country, and at *Búditippa* in *Súndah*, near the *Nugger* frontier. Regarding the origin of these ashes he gave no further account save the local traditions; viz. that some were the ashes of religious sacrifices performed by the holy *Rishís* in their hermitages, and some the funeral piles of remarkable heroes and other noted persons.

Búdigunta, the name of the place whence the specimens sent you were procured, signifies in the Canarese language the "hill of ashes."

VIII.—*Postscript to the account of Ursitaxus printed in the 19th Vol. of Researches As. Soc. By* B. H. HODGSON, *Esq.*

I have just procured another very perfect skull of the Ursitax, which exhibits the same formula of molar dentition as that described in my paper or $\frac{4.4}{4.4}$.

It is the cranium of a mature subject, but less old than the preceding, and I am thus enabled to correct that portion of the generic character which ascribes an almost ursine flatness to the crowns of the molar teeth.

In the present subject the coronal processes of those teeth are distinctly salient, with an obtusely conical form. A similar process rises from the inner heel of the great carnivorous tooth, above; nor is the transverse tubercular, next to it, wholly without symptoms of such a process.

The generic character should be corrected as follows:

'Cheek teeth $\frac{4.4}{4.4}$, strong, broad, low, and furnished on the crowns with obtusely-conical processes: the tubercular of the upper jaw, transverse, narrow, sub-parallelogramic, smaller than the carnivorous tooth, and essentially a grinder: no tubercular in the lower jaw,' et cæt. sicut prius scripta.

It has been suggested to me that our animal is a Glutton or a Ratel. But the dentition of the former, according to the Regne animal, is $\frac{5.5}{6.6}$; of the latter is $\frac{4.4}{5.5}$; and I possess several species of both con-

forming to those formulæ. The peculiar dental system of Ursitaxus is in harmony with *other* material peculiarities of structure; and the animal therefore seems abundantly entitled to generic distinctness.

As to the *species*, that is probably identical with the Ursus Indicus of Shaw, the Indian Badger of Pennant, and the Biju of Hindusthan, but which still wants (I believe) a scientific name. I suppose, therefore, mine of Inauritus will be recognised, unless we are to persist in incumbering the science with the vague names and descriptions of a half informed age.

IX.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 2nd November, 1836.

The Honorable Sir Edward Ryan, President, in the chair.

Mr. G. F. McClintoch, proposed at the last Meeting, was balloted for, and duly elected a Member.

H. Walters, Esq. C. S., Dr. J. M. Bramley, Dr. Drummond, Newab Tahawur Jung Behadúr, and Sháh Qabir u'di'n were proposed by Mr. James Prinsep, seconded by Sir Edward Ryan.

Dr. Jackson was proposed by Dr. Pearson, seconded by Sir Edward Ryan.

Read a letter from Mr. Vincent Tregear, acknowledging his election as an associate member.

Read a letter from Mr. C. Brownlow, returning thanks for the Society's patronage of the *Alif Leila*, and agreeing to the stipulation for the deposit of a file of the sheets, as printed, with the Secretary.

Read a letter from J. C. C. Sutherland, Esq., Secretary to the General Committee of Public Instruction, requesting to know at what price the Society would supply twenty-eight copies of the *Naishadha* and of the *Rája Taranginí*, required for the use of the Government Sanscrit College.

Mr. W. H. Macnaghten moved that the books should be given gratis if intended for deposit in libraries, as the encouragement thus given to the study of these works would promote the sole object the Society had in view in completing their publication. The Secretary explained that they were required as class books; that the present application would doubtless be followed up by a constant periodical demand for this and other works; that when he guaranteed the Society against any risk in undertaking to finish the suspended volumes, he calculated on the necessary school demand for many of them as one of the means of repayment; and the prices fixed were calculated only to cover the gross amount expended in their completion: he proposed furnishing them at a reduced price. Sir Benj. Malkin and other Members objected to a reduction of price, and it was resolved by a large majority that the ordinary selling price should be charged.

The Secretary submitted correspondence with the Secretary to the Committee of Public Instruction, relative to the Oriental works deposited for sale at the London Booksellers, which the Society's English Agent from a misconception had authorized to be transferred to the Society's account, and to be sold at reduced prices.

The transfer had been countermanded as soon as known; but the Committee refused to sanction any sales that might mean time have been made at the reduced prices, awaiting the report of the circumstances from their bookseller.

Read a letter from the Secretary of the Royal Academy of Marseilles, acknowledging receipt of the Researches and Journals presented last year.

Shah Qabir u'di'n applied to the Society to be allowed the loan, for the purpose of taking a copy, of a very valuable manscript of the Koran in the Library, depositing 250 rupees, the price at which it had been purchased by the Society.

Resolved, that he should be permitted to employ *kátibs* in the apartment to take the copy, but that the volume could not be lent out for such a purpose.

He also requested two copies of the last three volumes of the *Alemgíri*, of which the three first volumes had been supplied gratis to the *Susseram Madrassa* by the Education Committee.

Resolved, that this request be complied with.

Library.

A letter was read from the Secretary to Government, General Department, forwarding for deposit in the Library of the Asiatic Society the undermentioned 95 volumes, being a set of the Reports and Publications of the Commissioners of Records, of which three copies had been recently sent out (as printed on the reverse of the title page) "for perpetual preservation in some public library of the Bengal Presidency."

Report from Commissioners on Public Records, 1 vol.

Record Commission, Scotland; Correspondence of C. P. Cooper, Esq. Secretary to the Board, with Thomas Thomson, Esq. Deputy Clerk Regulation, 1 vol.

Reports from the Commissioners on the Public Records of Ireland, 3 vols.

La Commission Des Archives d'Angleterre, 1 pamphlet.

Public Records, the public advantages of entrusting the Records of the Exchequer, &c. 1 pamphlet.

Nonarum Inquisitiones in Curea Scaccarii, 1 vol.

Rotuli Hundredorum, 2 vols.

Valor Ecclesiasticus, 6 vols.

Inquisitionum Post Mortem Calendarium, 4 vols.

Manuscripts in the Harleian Collection, 4 vols.

Placita de quo Warranto, 1 vol.

Domesday Book, 2 vols.

Domesday Index, 1 vol.

Domesday Supplement, 1 vol.

Sir H. Ellis's Introduction and Index to Domesday, 2 vols.

Placitorum Abbreviatio, 1 vol.

Ducatus Lancastriæ, 2 vols. Pars prima and secunda, and Pars quarta.

Rotuli Scotiæ, 2 vols.

Rotuli Litterarum Clausarum, 1 vol.

Rotuli Litterarum Patentium, 1 vol.

Rotulorum Originalium, 2 vols.

Manuscripts in the Lansdown Collection, 1 vol.

Inquisitionum in Officio in Hibernia, 2 vols.

Rotulorum Patentium et Clausorum, 1 vol.

The Acts of the Parliaments of Scotland, 10 vols. (first volume wanting.)

Registrum Magni Sigilli, 1 vol.

Proceedings in Chancery, 3 vols.

Calendar to Pleadings, &c. 1 vol. marked Vol. II.

Fœdera, 6 vols.

Parliamentary Writs, 4 vols.

Letters sur la Cour de la Chancellerie d'Angleterre, 1 vol.

Letters to Charles Purton Cooper, Esq. of Lincoln's Inn, Barrister at Law, on the appointment of a Permanent Judge in the Court of Chancery in the place of the Lord Chancellor; 2 pamphlets.

Substance of the Speech of Charles Purton Cooper, Esq. as Counsel for the Rev. Charles Wellbeloved, in the suit of the Attorney-General versus Shore, instituted in the High Court of Chancery, respecting Lady Hewley's Foundations; 1 pamphlet.

Memoria du Commissaõ dos Arquivos du Gran Bretanha dirigida aos Cartorarios Bibliothecarios e Antiquarios de Portugal, pello que resputa aos trabathos e Exames da mesma Commissaõ; 1 pamphlet.

Proceedings and Ordinances of the Privy Council of England, 5 vols.

Rotuli Curiæ Regis, 2 vols.

Rotuli de Oblatis et Finibus in Turri Londinensi, 1 vol.

Rotuli Selecti Ex Archivis in Dom. Cap. Westm. 1 vol.

Excerpta è Rotulis Finium in Turri Londinensi asservatis Henrico Tertio, 1 vol.

Fines 7, Ric I. 16 Johan, 1 vol.

Rotuli Normanniæ in Turri Londinensi, 1 vol.

Statutes of the Realm, 12 vols. including 2 vols. of Index.

Manuscripts in the Cottonian Library, 1 vol.

Calendarium Rotulorum Patentium in Turri Londinensi, 1 vol.

Calendarium Rotulorum Chartarum et Inquisitionum ad quod damnum, 1 vol.

Taxatio Ecclesiastica Angliæ et Walliæ, 1 vol.

Read a letter from Mr. H. A. Horneman, forwarding for presentation a copy of the first number of the Numismatic Journal, on behalf of Mr. John Yonge Akerman, F. S. A. the Editor.

Meteorological Register for September, 1836, was presented *by the Surveyor General.*

Second Annual Report of the Statistical Society of London, presented *by Dr. D. Stewart.*

Literary and Antiquities.

Read a letter from H. T. Prinsep, Esq. Secretary to the Government of India, General Department, forwarding copy of a report furnished to the Government of Bombay from Colonel Chesney, of the proceedings of the Euphrates expedition, in its various departments.

[The substance of this report is published below.]

A memoir on the Antiquities of Bamián was submitted by Mr. Trevelyan, on the part of Mr. C. Masson.

The same member presented also a notice by Munshi' Mohan La'l, of *Uch Sherif*, a town near the junction of the five streams in the *Panjáb*, celebrated as the place of sepulture of many Mahommedan saints.

Mr. S. G. Heatly presented through Dr. Corbyn, the first of a series of mathematical essays on the use of functions in geometrical analysis.

Physical.

A large fossil fragment of the acetabulum of an elephant was presented by Dr. Spilsbury, found by him at *Sigouní*, the place where Captain Sleeman discovered the first indications of the Nerbudda fossils.

Brigadier Anburey, Engineers, presented on the part of Mr. Sweten-ham, some incrusted petrifactions of leaves from the calcareous springs in the Dehra Dun.

A specimen of the red-billed parrot *(Psittacus Sinensis)* was presented by Dr. Burlini, and a woodpecker by the curator, both mounted in the museum.

The Secretary read the following extract of a private letter from Dr. W. Griffith, dated Sadiya, Assam, 12th Oct.

"I have much pleasure in informing you that I have lately completed the arrangement of the collections of the Musci and Hepaticæ made during our late deputation into Assam. The collection of the former amounts to 154 species, or to about an eighth of the whole known number. It includes twenty-seven genera, of which I have ventured to characterise two as new. That of Hepaticæ includes forty-eight species, of which thirty-one belong to *Jungermannia* alone, and ten genera, of which five appear to be new. Almost the whole of both these collections were made by myself on the *Khasiya Hills* between *Chur-*

ra Punjt and *Nunklow*, and within a period of seven weeks. Both these orders have hitherto been almost totally neglected by Indian Botanists; and the greater part of the few that have been described seem to have been sent from *Nipál* by the Honorable Mr. GARDINER. Hence, owing to the impossibility of obtaining advice, and as my situation obviously precludes me at present from consulting the requisite authorities, I have determined on sending the MSS. and drawings to England, accompanied with a complete series of both collections. By the adoption of this plan the stability of my very numerous new species will easily be determined*."

X.—*A General Statement of the labors and proceedings of the Expedition to the Euphrates, under the command of Colonel* CHESNEY, *Royal Artillery, F. R. S.*

The object of the present communication is not to anticipate the interest which must be felt, and especially by the members of the Geographical Society, as well as other public bodies, not only in the progress of the Expedition to the Euphrates, but also in the results obtained to science and general knowledge; for, to render these of any real value, they must be accompanied by the details of the means by which they were acquired. It is rather, therefore, with a view to the exhibition of how those means have been hitherto applied, and how the capabilities of the Expedition have been directed, that the present statement is made; not, however, omitting those details which a brief notice of this kind will admit, when touching upon the labour, the progress, and the present condition of the enterprize itself.

The voyage to *Malta* from *Liverpool* occupied a period of twenty-nine days, a great part of which time was taken up in working out the details, and consolidating the original plans of our commander. Among the scientific labours, independently of questions of general navigation and drilling the men, were the rating of the chronometers, observations in meteorology, the temperature of the sea, and researches in natural history.

At *Malta*, some time was devoted to the determination of the intensity of magnetic forces, and the amount of the dip of the needle. The cylinders used for the former experiments consisted of two pair that had been tried by Captain SABINE in *Limerick*, and another obtained through the kindness of Professor LLOYD, T. C. D. and tried at *Dublin* previous to departure. The whole set being subsequently experimented upon in *London* by Lieut. MURPHY, R. E. and also at *Liverpool*.

An exploratory tour was also made in the interior of the islands, *Malta* and *Gaza*, with the view of recognizing in a general way their geological structure and natural productions. Some fossil shells of interest were obtained, also the plants of the season (March), and some species belonging to the classes *Tunicata*, *Acaleppa*, *Malacodermæ* and *Polypi*.

During the stay at *Malta*, Colonel CHESNEY was much occupied with the general objects of the Expedition, more particularly about the construction of flat boats. The *George Canning* had been separated from the *Alban* Steamer her consort, by rude weather, off *Cork*, and it was found impossible to remedy this loss at the Mediterranean station; but the Admiral, Sir JOSIAS ROWLEY, allowed the *Columbine* sloop to accompany the Expedition to the mouth of the *Orontes*; and there was certainly every reason to rejoice in this arrangement; for not only was the *George Canning* taken in tow by the brig at all times when the weather permitted, but Commander HENDERSON and his officers secured the gratitude of every member of the Expedition, by the most efficient and zealous services in landing the stores.

The difficulties and opposition to the landing of the stores are already known from the various reports that have reached England. Success was only obtained here in the first instance by the bold step of an immediate landing without a reference to the authorities of the country, and by exposing and remonstrating

* We hope soon to receive from the Tea Committee some account of Dr. GRIFFITH'S previous labors. We hear that the several reports of Dr. WALLICH, Dr. GRIFFITH, and Dr. MCCLELLAND have been some time sent in.—ED.

in the second, against the system of subterfuge carried on by the Syrian Government towards the expedition; and its commander visited Ibrahim Pacha at *Tripoli*, in the hope of persuading him to give, at least for a time, that assistance which had been promised unreservedly by the Viceroy himself.

The connexion between the *George Canning* and the shore having been established by means of an hawser extending from the ship across the bar of the *Orontes*, a distance of 1200 yards, parties were sent on shore from the *Columbine* and *George Canning* with tents for their accommodation, and the disembarkation was carried on with such spirit and activity, that the site designated as "Amelia Depôt" soon became a little camp with a very mixed aspect, replete with bustle and useful occupation. The bar at the mouth of the river was at times dangerous, and on one occasion Commander Henderson with his boat's crew narrowly escaped a watery grave.

The observatory being now fixed, Lieutenant Murphy applied himself to astronomical observations, more especially with the fine transit instrument that had come out with the Expedition. The survey was soon afterwards began under Lieutenant Murphy, Mr. Thomson, and Mr. Stenhouse, (who was sent by the Admiral) at *Lattaquia* (Laodicea), but was limited to a determination of the outline of the coast with its soundings, and an examination of the coast itself. Mr. Ainsworth also accompanied the party for purposes of natural history. The sites of *Heracleum* and *Possidium* were recognized. On their return an excursion was made to the summit of Pliny's wonder, *Mount Cassius* or *Gebel*. The succession of the various forms of vegetation was noted. The party bivouacked near the summit, on which, April 28th, there still remained some patches of snow. The results given by the Barometer, which was observed at various heights, compared with a register kept at the same time by Mr. Eden in the Depôt, coincided closely with those obtained trigonometrically by Mr. Murphy, and which gave for the elevation above the sea 5318 feet. But this mountain, notwithstanding its great height, is entirely composed of supra-cretaceous limestones, characterized by cones and cerithii. At its north-eastern foot is an extensive deposit of highly crystalline gypsum, and to the south-east diallage rocks and serpentines break through the same formations, accompanied by lacustrine marles and siliceous limestones.

On the 29th of April, a party consisting of Lieutenant Murphy, Mr. Ainsworth, and Mr. Thomson, left the *Orontes* in a country boat to commence the survey of the Gulph of *Scanderoon* and its neighbouring shores. The first points visited were *Arsons* and *Rhosas*. An ascent was then made to *Gebel Kaiseria*, on which they bivouacked. Next came *Scandernoon*, and in its neighbourhood Jacob's Well, the site of *Myriandros*; to the south, the pass of *Bylan*, gates of *Syria* (Ptolemy), *Amanian Gates* (Strabo), a defile in the mountains separating the *Amanus* from the *Rhosas*, and leading from *Myriandros* into the plan of *Antioch* or *Umk*.

To the north the remains of a marble gate-way, commonly called Jonas' Pillars, (*Cilicia* Gates of Ptolemy, Q. Curtius and Arrian:) this was the midnight halt of Alexander. The description of Zenophon refers to a narrow place contiguous to the sea; that of Arrian to the ascent of the hills that shut up the same plain contiguous to the sea. The latter applies itself distinctly to these ruins. Half a mile north of the Cilician Gates, is the river *Markotsaye (Kersus)*, and beyond a wall terminating in the sea with a tower. At the foot of the mountains, the *Kersus* passes between two walls near the village of *Merkets*. This is the wall and gates of Zenophon. They are built of stone. Farther north is *Byas (Baias* Anton. Itiner. *Myrcandros* of Williams' Geography of ancient Asia) and there are several populous villages between *Byas* and the *Issus (Pinarus)*. At a subsequent period, in company with Colonel Chesney, this river was examined in detail, as also the ruins of a considerable town near some hills which enclosed the Issic plain to the north-west—the *Giaour Dagh*, or *Amanus*, being the east pass of Darius, Armenian Gates of Arrian; the whole corresponding closely with the last mentioned author's description. Where the gulph runs to the west, there are ruins of forts, castles and gateways. From thence proceeding north-west by *Kurd Kulac* (Wolf's ears) *(Jordequiea* of D'Anville and Rennell) to *Missis (Mesis)* at a pass through

low hills of sandstone, are the remains of a road and archway constructed in part of sandstone, but chiefly of polygonal masses of basalt and laval, which no doubt have given rise to its name, *Demir Kapon*, Iron Gate, and *Kara Kapon*, Black Gate,—the Armenian Gates of PTOLEMY; *Amanicae Pylæ* of Colonel LEAKE; Upper Armenian Gates, RENNELL; *Timour Kapon*, or the Gate of *Tamerlane*, (*Mecca* itinerary by Geographical Society of Paris.) From hence the party visited *Ayas* (*Agæ*) the mouths of the *Jihoun* (Pyramus), where an interesting examination took place of the progress of alluvial deposits. The most westerly point reached was *Karadash*, the site of *Mallus* and *Megarsus*. The whole of the party being sick, the pass of *Bylan* was the only position examined on the return to *Antioch*.

In the neighbourhood of Amelia Depôt, the points of most interest were the course of the *Orontes*, examined by Lieutenant CLEAVELAND, Messrs. EDEN, CHARLEWOOD, and FITZJAMES; and the ruins of *Selucia Pieria* also made the object of interesting researches. About the same time, various other undertakings were in progress. The gentlemen already named, in conjunction with Messrs. HECTOR and BELL, were in turns employed on different points, repairing and widening the road from the mouth of the *Orontes* to *Antioch*; a work of considerable labour, especially in making the fords over the rivers practicable for waggons. Captain ESTCOURT and Dr. STAUNTON had gone on a journey of remonstrance to the Civil Governor of *Syria* at *Damascus*,—visiting as they returned *Bualliec* and the cedars of *Lebanon*. Lieutenant LYNCH was employed in improving the line of route from *Antioch* by *Djezer haded* to *Bir*; and, lastly, Lieutenant COCKBURN was employed (after Captain ESTCOURT's visit to RESCHID PACHA at *Diarbek*) in throwing up some slight field works, and constructing slips at a spot selected for this purpose, 1¾ miles below *Bir* on the right bank, and now called Port William.

To avoid the mischievous effects of idleness, as well as to carry the heavy weights to *Antioch* by water (when denied all other local means by Government), the *Tigris* was put together on the *Orontes* during the month of May as a working shell, in which state she was steaming experimentally, when the PACHA withdrew his outward opposition on the 3d of June. Towards the middle of that month commenced the dispatch of the light stores on camels and mules, and towards its close some trains of waggons* passed through *Antioch* carrying heavy weights, but this being found a dilatory operation, the water communication was looked to once more, along a new line which promised many advantages. The *Orontes*, the *Lake of Antioch*, and the *Kara-son*, were, therefore, examined; and upon the reports and maps thus obtained, the Commander ordered a Depôt (the 2d) to be formed at *Goozel Burge*, "pretty tower," a village on the *Orontes* 3 miles above *Antioch*, when the infinite variety of *materiel*, including the more ponderous objects, such as boilers, the eight sections (into which the *Tigris* had been divided,) diving bells, &c. were to be put on rafts, flat boats, and pontoons, in order to be transported by the *Orontes* into *Kara-soo*, (black water,) and along this navigable stream into the Lake *Owja Dengis* (white sea,) keeping along its western side on account of the deeper water, and ultimately ascending the *Ultra Kara-soo* to a spot called *Moorad Pacha*, near the Village of *Gule Bachee*, "head of the waters," a little beyond the junction of the Aswad and Yagra rivers, the whole distance being fourteen hours from *Goozel Burge*. The abundant spring called *Gule Pachee* issues out of a pseudo-volcanic mound rising out of the plain. The Bridge of Moorad Pacha is chiefly a causeway resting on the soil, but in parts supported by arches, and crossing that part of the plain of *Umk* which is most liable to be inundated, for a distance of about three miles. This plain is inhabited by pastoral and Nomade Turcomans living in tents, who are a quiet people. The ancients appear to have known in this tract the rivers Oinaparas, Arcenthus, Labotas, Ufrenus, and the ditch of Meleagrus. The actual fluents of the Lake are the *Aswad*, or *Asond*, the *Yagra* (uniting to form the *Kara-soo*) the *Aphreen* traversing the Cyrrhesteca, the rivulet of *Hareem* and the *Orontes*, but the first mentioned have various tributaries to the north, with different appellations. On the road

* Twenty-seven vehicles of different kinds were constructed at Amelia Depôt, and there were thirty-three, including the artillery waggons, from England.

to the valley of the *Aphreen* are some Thermal springs, El Hammam, " the Baths," issuing at the point of junction of plutonic rocks with tertiary dolomites. The waters of these springs are said to have originated with different earthquakes, and present corresponding differences of temperature.

It is a distance of about 111 miles across the so called " Syrian Desert" from Moorad Pacha to Port William. The first part of it is hilly but not infertile, between El Hammam and *Azass*, or Arsace Menniza of Ant. Itinerary (MSS. of Colonel Chesney). The second part from *Azass* to Port William is for the most part level, at the best undulating, containing the valleys of the *Kowick* (Chalus) and the *Sajour*. These plains are every where fertile, for the most part cultivated, and abounding in populous villages, consisting of Fellah Arabs, Kurds, Turkish tribes, and mixed races, possessing bullocks in great abundance along the whole of the direct line which passed a little way southward of *Aintab*, the ancient Antiochea ad Taurum, and now a garrisoned town of large size and some commercial importance.

The general arrangements for the transport were, that Lieutenant Cleaveland and Mr. Charlewood were to carry the boilers, &c. to *Goozel Burge*, from whence they were to proceed under Mr. FitzJames to *Moorad Pacha* by water, to be conveyed from thence to Port William by Captain Estcourt, assisted by Mr. Eden; and as there was a line of waggons connecting the boats with the sea on one side, and to the Euphrates on the other, the three portions of the grand line were simultaneously in operation, and also a fourth, viz. camels and mules, carrying the light stores direct from Amelia Depôt to *Port William* by the *Antioch* route through *DjezerHadid**. At first every thing went on well, and promised a rapid conclusion. Lieutenant Cleaveland obtained bullocks with a moderate degree of difficulty, and his ingenuity and perseverance† did the rest by removing every thing to *Goozle Burge*, where they were successively embarked for *Moorad Pacha;* but here things were immediately at a stand still, and although the strongest orders (in appearance) were constantly issued by Ibrahim Pacha, very few bullocks could be obtained even at the highest prices by Captain Estcourt, whose unwearied efforts could only secure the tantalizing but ingenious result of an abundance of bullocks along the whole line, *except the first and last stages;* consequently the boilers which had remained for ten or twelve weeks on their carriages, might have continued at *Moorad Pacha* until now, if we had not exerted ourselves to bring them on, one at a time, with our own horses, instead of bringing on a number of the heavy weights at the same time with the bullocks; and the result was, that the officers and men had to toil along the great line of route from *Moorad Pacha*, exposed for months to the great heats of noon, the chills of night, and to the baneful effects of what Humboldt expressively calls an extreme climate, the thermometer being as high as 110° in the shade, (July) and as low as 8° in the winter, during which some of the boilers were flooded, and the diving-bell actually lost in an extensive sheet of water near El Hammam. This had been in all likelihood the original object of the Pacha, and the *Euphrates* being already complete, bullocks were given to perform the impossible (as was thought), task, of bringing on the *Tigris'* boilers‡, which were warped out of the lake by manual labor, and ultimately taken to Port William by Lieutenant Cleaveland, Messrs. Eden, Charlewood and Hector, the only officers in the Expedition then effective. Not one individual officer or man employed on this enterprize escaped at least one serious illness, nor is it at all surprizing that some§ fell victims to trials so long continued, and to a climate so often replete with morbid miasma as *Moorad Pacha*, the worst of the stations: yet the malaria only proved fatal when other causes combined to render it so; nor need the splendid scenery, nor the magnificent

* Eight hundred and forty-one camels and 160 mules were employed in all, and the greater part of these caravans were stopped on the frontier by the Pacha, in order to cause delay by forcing us to bring others from the Sultan's territory.

† In addition to pullies, &c. the boilers were actually moved up the hills inch by inch with jack screws by Mr. Charlewood and Lieutenant Cleaveland.

‡ Mr. Hector found the diving bell by means of long poles, and then rolled it under water for the most part half a mile to its carriages.

§ Seven men of the Expedition and one workman.

climate of *Syria*, be approached with fear, for its malaria is not a pestilence, and the circumstances under which the Expedition was placed, toiling on lakes and rivers, dwelling in the marsh, with almost reckless exposure to the sun of the day, followed by the dew of the night, require a separate consideration; and perhaps the surprize will then be, that a greater fatality did not occur amongst a body of men (about 85), in general unseasoned, during the laborious and almost unexampled transport of two large iron vessels, which, thanks to the care of all, have since been set up*, and are now steaming with their boilers, engines, &c. quite as safe and even more perfect in their working details than when sent out of the maker's hands at *Liverpool*, notwithstanding a long journey, with all the difficulties which could be thrown in the way by the Local Government underhand.

Previous to taking medical charge at the station at *Moorad Pacha*, Mr. Ainsworth had made an examination of the less frequented countries immediately south of *Antioch*. He crossed the mountains at *Beit El Moie* (the Daphne of Pococke,) and entered forests which covered a great basin of tertiary rocks chiefly cerithia limestone, silicious limestone and lacustrine marles, with gypsum every where broken up and dislocated by serpentines and diallage rocks. It is only in the valley of *Antioch*, that the Pliocene formations shewed themselves, and enabled Mr. A. to determine the period of the elevation of the plutonic rocks of the silico-magnesian series. From *Lattaquia*, he followed Maundrell's route by the country of the *Maronites* and *Gebel Kraad*, the northern prolongation of the *Ansarian* mountains, and by the valley of *Bedame*, rich in scammony *(convolvulus scammonia)* to that of the *Orontes*, which he joined at *Djezer Shogher*, the *Larissa* of Gosselin, and *Seleucus Belus* of D'Anville. A Roman road led to *Koalat el Medyk*, where are ruins of a highly ornamental character. Part of the town is enclosed in an ancient castle situate on a hill; the other ruins lie in a plain part of a strong wall, and an archway still exist, and also the remains of a temple. In the adjoining lake are the celebrated black fish, the sources of a distant commerce, which were recognized to be the *Macropteronotus magur* of naturalists. From *Medyk* he visited the little centre of primitive Christianity in the mountains of *Reiha* and *Edlip*, abounding in monuments of a then new hierarchy, returning subsequently by the borders of the great plain to *Antioch*.

At this period, August 1835, Lieutenant Murphy commenced the grand line of levels which was to be carried from the Mediterranean to the Euphrates, with reference to canals, and many other objects of deep interest connected with science and calculated to encourage this extensive work.

Many obstacles occurred at first; prolonged malaria had unfitted all for exposure to the sun. Lieutenant Cockburne and Mr. Thomson after a short exertion were both laid up. Lieutenant Murphy was also seriously ill. Ultimately after another beginning, the last mentioned industrious officer left for *Port William*, where he was required in the observatory, and levelling was continued by Mr. Thomson, who has just completed this important part of the original plan.

Nearly at the same time a party composed of Lieutenant Lynch, his brother, Mr. Staunton, and Mr. Elliot, set out on a mission of a friendly and conciliatory nature to the Arabs. They visited the tribes of Welda, Aniza, Geeza, the Bore-sipahi and some of the Turcomans, from all of whom they met a favorable reception. The Aniza alone shewed a doubtful disposition, and the Bore-sipahi, one of their tributaries, wounded one of the servants severely. This hostility did not, however, appear to be directed against the Expedition so much as with the view of plundering those gentlemen who had ventured amongst them, and the Sheikh immediately offered to compromise the matter by presents, which were declined as a matter of policy, in the hope that an unsettled affair of blood may tend to keep the Aniza in better order as regards their future intercourse with the Expedition.

In the early part of January last, Colonel Chesney left his bed, and was actually put on his horse to prosecute a scientific journey to the *Taurus*, and part of

* The labor fell chiefly upon Captain Estcourt of the 43d Light Infantry, Lieut. Cleaveland, Messrs. Eden, Charlewood and FitzJames, R. N.

Asia Minor. He was accompanied by Lieutenant Murphy and Mr. Ainsworth, both invalids; also Mr. Staunton. The party proceeded by *Antab* to *Killis*, and thence to the Eastern acclivities of the *Amanus*, in the parallel of the *Issus*, but no passage could be effected at that season of the year. Repelled to the south, the mountains were passed by *Pagrae*, through the *Beilan* pass, to *Scanderoon*, from whence the party proceeded by the Cilician Gates and *Byas* to the plain of the *Issus*. Sufficient time having been devoted to the examination of the various questions of historical geography, connected with this most interesting district, the great road towards *Constantinople* was followed by *Demer Kapon* to *Kurd Kulac*, "the Wolf's ear," (Jardiquiea) and by the plain of *Tachokour Ova*, "the valley of the ditch." Crossing the *Gebel Elnour*, the mountain of the light, bearing on its rocky summit to the north, *Shah Merar*, "the Castle of the Serpent," and along the left bank of the *Jihoun*, *Djehan soo*, "the river of the world," to *Missis*, the ancient Mopsuestia, now almost in ruins, but once (like Tarsus) one of the chief cities of *Cilicia*. From *Missis* the party continued, cross the plain by *Adana* (head-quarters of the Pachalic) to the last mentioned town, where they found the French Consul, Mons. Gilet, engaged in excavating a monument close to the place, of great solidity, and apparently very remote antiquity. It consists of an enclosure in the form of a parallelogram, with two transverse masses of similar form at one extremity; the walls and masses were of the most solid construction, without the least appearance of any thing like a sepulchral chamber in any part of this extensive mass,—at least as low down as the level of the ground around it.

The road followed on leaving *Tarsus* led over the sub-alpine country at the foot of the *Tarsus*, consisting of tertiary rocks in great variety. Near the centre of the Tauric chain the lead mines of *Kulé Boghaz* were visited: they occur in limestone belonging to the cretaceous series, and are in the valley south of the grand pass of the same name, but worked most injudiciously. The pass itself was then examined almost to the summit level, and the party regained the more level country on the south side of the great mountains, in order to visit the town of *Sis*, and the border territories of the Sultan and Pacha. Here the inhabitants had so bad a name, that no muleteer or guide could be induced to proceed along the mountains in that direction, and whilst overcoming the difficulties made by the alarms of the people, Colonel Chesney and Mr. Ainsworth were separated from the rest of the party, and made their way to *Sis* on foot by one line, whilst Lieutenant Murphy and Mr. Staunton reached it by another; each traversing a romantic and beautiful country formed by the wooded abutments of the Taurus, and well peopled by the best disposed peasants imaginable, instead of being all robbers, as they were represented. During about 125 miles of country, composed almost entirely of tertiary sandstone, (ostracite sandstone of Kupffer,) they crossed the *Seihoun*, the *Jeihoun*, the *Corrykoon*, and several smaller, yet good sized rivers watering this interesting country, which terminate at *Sis*, the residence of an Armenian Patriarch, the third in importance at the present day, with a respectable palace, and a large convent in his charge; whilst at *Sis* an incursion was made into the Taurus and the mountain of *Kara Sis*, *Black Sis* ascended, after crossing a part of the crystalline plutonic formations. The researches were then directed towards *Anasaiba* on the plain. The ruins of the city are still extant, backed by an insulated mountain, bearing a castle of various architecture. Such solitary hills rising out of the plains are not unfrequent here, and they mostly bear castellated buildings on their summits, as *Sis Shah Meran*, *Toome*, *Anusaiba*, and others. From *Anasaiba* the party crossed the plain of the village and district of *Kars*, and there entered the mountainous country which led by *Analat* to *Marash*. The chain was not crossed without much difficulty; the narrow pathway was carried alongside, and down precipices that were very steep; so much so, that it became necessary at times to unload the horses, and carry the baggage over the most dangerous places. The culminating point of this part of the Taurus is called *Durdoon Dagh*. The chain is composed of mica slates, clay slates, with graphite or plumbago, quartz, schists, quartzites, and diorites, with uplifted limestones belonging to the supra-cretaceous series. The great and massive mountain which rises above *Marash*, and is there known by the name of

Arga Dagh consists of tertiary sandstone and limestone tilled up by and reposing on serpentine and diallege rocks, which would indicate different geographical connections. The direction of the *Arga Dagh* is nearly from SW. to NE.; that of the shistose chain of *Durdoon Dagh*, a little south of east; that of the *Giaur Dagh* (Amanus) is the same as *Arga Dagh*. Colonel CHESNEY returned to *Port William* from *Marash*, leaving directions for the remainder of the party to proceed in the direction of *Samsat*, *Orfa*, &c.; but being thrown back on *Romkala* by the swollen rivers, they returned to *Port William*, surveying the river between those places. During the whole period of their progress the positions of the principal places, ancient and modern, were determined astronomically by Lieutenant MURPHY, and careful itineraries kept, in addition to bearings taken, when practicable, with the theodolite or Kater's compass, according to circumstances. The results of these labours has been, in the first place, to connect the survey of the coast of *Lattaquia* and that of the *Issus* with that of Captain BEAUFORT; and, in the second, to join those surveys to the Euphrates. There are ample materials for laying down a map with such a degree of accuracy as will, it is hoped, enable the learned to determine many points of ancient history and geography, especially those depending upon the length of the stadium, the parasang, and other scales of measurement used by STRABO, PLINY, and HERODOTUS.

On the day following the return of the first party, another was sent out by the commanding officer to finish that part of the plan which had been interrupted. This one consisted of Lieutenant LYNCH, Mr. EDEN, R. N. and Mr. AINSWORTH. Agreeably to the instructions received, the party took up the former work at *Romkala*, proceeding from thence along the left bank, carefully surveying the river as far as *Samsat*, the birth-place of LUCIAN. The ruins of this celebrated place are just recognizable. The modern town small and poor, but the valley itself fertile, as it is described to have been in former times; and ferry-boats are still kept up to pass the river to and from *Orfa*. The course of the Euphrates from this ancient *Zengma*, to that above *Bir*, differs from what has been represented on most maps: it flows, in fact, in the general direction of south-west, and is not turned, as an incorrect reading of STRABO would infer, (RENNELL and D'ANVILLE) to the south-east.

Samosat having been fixed, it was then connected astronomically as well as by an itinerary, with *Orfa*, (*Calli-rhoe*, *Roha Orfah*, in its progress of corruption, *Edessa*, and *Antiochea* under successive masters.) To the north of the city are evidences in conic lines, and circles of elevations of pseudo volcanic action. The fish venerated so much in ancient times, are still preserved in the marble basins of the mosque of *Abrania*, and were recognized to be a kind of Barbel. From *Orfa*, the great Mesopotamian plain was crossed in the direction of *Harran*, "Carrhas clade crassi nobiles," and still more interesting as the residence of ABRAHAM. *Harran* was also connected with its rival in antiquity, *Serug*, of which scarcely a vestige remains. In the plain around the ruined site of the latter place, the party met two colossal lions, sculptured in basalt with refined taste (*Basanite* basalt, with disseminated augite); these may possibly be the remains of that vanity which prompted ANTONIUS CARACALLA to assert that a lion had fought by his side in his Parthian wars.

Doctor HELFER having been separated from the rest of the party when proceeding towards the Taurus, a journey made by him to the Salt Lake south-east of *Aleppo*, led to the discovery of an ancient city near a basaltic range, four hours S. E. of the Lake. There are some remains of a temple and several Greek inscriptions which have been furnished, with a detailed description of this hitherto unknown place, by Mr. HELFER.

Early in February an opportune reinforcement arrived, consisting of four sappers from England, and six seamen from the *Columbine*, which restored the Expedition to its original strength; and the pendulum, dipping needle, and other experiments being completed, the Expedition was put in motion on the 16th March. The *Euphrates* taking the lead to survey, and give the benefit of the rough charts, and a pilot to the *Tigris*, in order that she might follow at one or at most two moves, and thus spare fuel as much as possible.

Previous to the actual descent, the *Euphrates* passed up rather a bad rapid, and stemmed the strong current as far as the town of *Bir* in the most satisfactory manner, displaying the Sultan's standard, and saluting him with 21 guns, which were returned from the castle and by the acclamations of the astonished Moslems, who crowded both banks to be *really* certain that iron could be made to float, and to surmount the force of a current, now *overcome for the first time*, and God was blessed for such a creation, and sending men amongst them, ten of whom could take their town, was added.

Since the departure, 101 miles of the river have been carefully surveyed in the following manner. A boat was dispatched ahead usually for a distance of twenty or twenty-five miles, sounding, and taking bearings, which being placed on paper when the officer returned, he became pilot to the vessel for the distance examined; and a second set of bearings, with a double set of soundings, were taken from the vessel's deck. Simultaneously with the water operations thus carried on by Lieutenant Cleaveland, Messrs. Eden, Charlewood, FitzJames, and Hector, there were two other sets on land; viz. a chain of grand trigonometrical angles along the principal heights, based on astronomical points, by Lieutenant Murphy, R. E.; and a smaller one, with a succession of short base lines from bend to bend, by Captain Estcourt, who is now laying down a map with his details of the ground, &c., and also embracing the labors of all his coadjutors: so that it is hoped, that the map of the important part of this great river will be sent home almost immediately*. A similar method of surveying is to be organized immediately on board the *Tigris*, so as to carry the work on to *Bussora* in the same manner, each vessel taking a separate section of the labor.

Our land parties, as well as the water, naturally involved much intercourse with Arabs, who have shewn themselves well disposed, except in one instance, when it became necessary to fire a 9-pounder blank to save a Sheik, their enemy, who was attacked whilst in our boat.

The state of the river is very favorable, although we run aground, owing to the deception caused for the moment by a bright meridian sun: but the deep part of the river was 420 yards wide at the spot in question, where we remained some days digging the vessel out, nor did she suffer in the slightest degree†.

XI.—*The Governor General's Conversazioné.*

On Tuesday, the 9th of November, was held the first of a series of entertainments, which we hail as the harbingers of a new era for Science and Research in India. Acting on the example of the Duke of Sussex, President of the Royal Society, Lord Auckland, as Patron of the Asiatic Society, has expressed a desire to assemble around him at these periodical parties, in a social way, not only the members of the Society, but all residents and visitors at the metropolis, who are known to cultivate the fine arts, the sciences, or literature, and to collect on his tables for their inspection and amusement, in the language of our motto, 'whatever is performed by man or produced by nature.' Thus without interfering with the formal proceedings and records of the several scientific bodies, those who contribute thereto will have the satisfaction of knowing that their donations or their inventions will be likewise viewed by the head of the Government, and by a much more numerous assemblage than could ever be enticed to an ordinary meeting. Distant merit will feel that it is sure of appreciation, and ambition secure of notoriety. Schemes for scientific exploration—plans of national improvement—useful mechanical invention—promising talent in the fine arts,—will be brought forward, canvassed and encouraged, where encouragement is due,

* Also the specimens already collected in the different scientific departments of geology, natural history, &c.

† The above report was addressed to the Bombay Government, previous, of course, to the disastrous hurricane which wrecked the Tigris, and destroyed so many lives.—Ed.

and the stimulus which has been wanting since the days of MINTO and MOIRA, will again be restored.

We have hardly room to describe the conduct of the first meeting, nor do we think any formal report of a soirée, intended to be private, and sans formalité, would be becoming. It is more to satisfy our distant readers as to the nature of the parties, which they can so materially benefit, to speak paradoxically, *by their absence*, that we venture to insert the brief notice, which appeared in the daily papers.

"The south-west or drawing-room wing of the Government House was tastefully laid out with all the novelties in the arts, in antiquities and in natural history, that could readily be brought together. On the pier tables of the corridore leading to the rooms, were disposed very numerous specimens of the plants now in flower at the Botanical Garden, each ticketed with its classical name.

"On entering the ante-room, a very splendid collection of insects was seen displayed on the tables and against the walls, in convenient cabinets: the newest addition to these, (which comprised a portion of Dr. PEARSON'S and of the Asiatic Society's cabinets) was the donation of Mr. GEORGE LOCH of the Civil Service, to the Asiatic Society, at a recent meeting. A fine collection of shells just received from His Excellency the Governor of Ceylon, was distributed on the side tables of the principal saloon. In an adjoining apartment were selected fragments of the rich and highly curious Buddhist sculpture, discovered by Captain CUNNINGHAM, in the neighbourhood of the SA'RNA'TH tumulus near Benares, and presented by him to the Asiatic Society. On another table the last fossil discovery by Dr. SPILSBURY, the socket of the thigh-bone of an elephant from the rock at *Segouni*, whence Capt. SLEEMAN first brought to light the fossils of the Nerbudda valley. By its side were placed the femur of a modern and of a fossil elephant (the latter of an animal 15 feet in height) to shew that the present socket must, from its curvature, have belonged to a still more monstrous animal!

"On the round tables of the drawing room were spread out numerous beautiful drawings—of Mr. Hodgson's Nipal Zoology; of Dr. CANTOR'S collection of Indian Snakes; of Dr. MCCLELLAND'S Assamese Zoology; and all the designs sent in to the Committee of the Metcalfe Library. In other convenient spots were displayed a wax magnified model of the human ear: stuffed objects of natural history, and models of Malay praws, presented by Capt. CHADS, &c.

"After the company had severally made the round of these objects, their attention was drawn to the table which Professor O'SHAUGHNESSY had prepared for the exhibition of his very ingenious model of the application of the late galvano-magnetic discoveries to the practical attainment of a working power.

"It would be impossible here to describe fully the construction of this curious wheel:—a number of horse-shoe magnets of soft iron, with wire coiled round them, were arranged on its spokes, so as to present their poles successively in rotation before the opposite poles of a more powerful magnet (also artificial) fixed on a stand at the side; the wires of the several wheel magnets were conducted in a manner not readily seen, so as to terminate in mercurial cups, into which were dipped the two wires of a small galvanic battery; on charging the latter, rotation ensued, and by a contrivance, as each revolving magnet arrived by the force of attraction, at the fixed magnet, its poles were instantaneously reversed so as to cause repulsion, while the next magnet above was attracted. We hope to see a full account of the Professor's successful adaptation when his apparatus is matured. The model worked steadily with 10 oz. power.

"The converse of the problem, or the development of a galvanic force from the ordinary magnet, was then exhibited on an adjoining table by a beautiful apparatus belonging to Mr. JAMES PRINSEP. Water was decomposed by the magnet; a candle was lighted by it; and an electric shock was administered to many of the spectators, among whom the native gentlemen in particular betrayed considerable astonishment at its effects.

"At the close of the evening refreshments were partaken of in the marble hall, and the guests retired at half-past eleven, apparently much pleased with the novel entertainment prepared for them by their illustrious host."

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of October, 1836.

Day of the Month.	Observations at 10 A. M.							Calculated Humidity.			Observations at 4 P. M.							Calculated Humidity.			Register Thermometer Extremes.		Rain.	Wind.		Weather.	
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew point.	Hair Hygrometer.	Centesimal tens. of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	New Standard Barometer.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew-point.	Hair Hygrometer.	Centesimal tension of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	Cold on roof	Heat in sun.		10 A. M.	4 P. M.	Morning.	Evening.
1	29,680	29,715	82,9	5,3	5,6	75,0	85	77	71	68	29,587	29,640	87,5	9,9	10,0	71,2	79	61	60	57	75,1	112,2		S.W.	S SW.	fine.	fine.
2	,746	,784	83,3	8,5	9,1	67,0	78	64	59	56	,659	,712	85,6	12,1	10,5	67,0	75	52	55	51	72,2	109,5		N.E.	N.	clear.	clear.
3	,737	,782	83,7	3,8	8,3	67,6	80	62	60	59	,632	,708	88,9	16,7	16,6	62,0	70	38	42	44	70,2	110,5		s. w.	S. W.	do	do
4	,771	,820	84,6	10,6	10,5	66,0	77	65	55	54	,669	,744	89,5	16,0	16,0	60,0	68	32	38	41	70,5	112,2		sw.	S. W.	do	do
5	,793	,844	84,3	11,7	11,0	65,8	78	52	55	56	,686	,755	88,6	14,4	14,0	61,8	74	45	42	50	71,0	103,2		S.W.	S. W.	do	do
6	,821	,879	85,0	9,3	9,3	69,0	78	62	60	56	,724	,790	88,2	12,4	11,1	68,8	77	52	54	54	70,0	112,8		nw.	nw.	do	cumuli.
7	,862	,916	84,5	9,7	8,8	68,0	78	60	59	56	,724	,793	88,3	11,9	10,6	69,5	76	54	55	52	68,2	111,6		nw.	nw.	do	clear.
8	,808	,862	82,4	6,4	8,2	71,5	81	72	70	61	,673	,740	89,0	11,7	9,3	71,0	77	55	57	54	70,3	102,8		nw.	nw.	cumuli.	cum. fine.
9	,824	,870	85,4	8,4	8,5	72,0	80	65	64	59	,714	,778	87,8	10,8	9,7	70,8	77	57	58	54	72,4	107,5		o.	nw.	hazy.	do
10	,856	,883	84,8	7,7	8,3	71,8		67	66		,713	,770	90,3	10,9	11,1	73,0	78	59	58	56	72,5	105,7	0,03	n.	n.	cir. stratus.	clear.
11	,862	,899	85,3	5,5	5,7	74,0	86	77	70	70	,754	,810	85,4	4,8	4,4	75,5	87	80	73	72	72,2	101,0	0,15	ne.	nne.	cum. fine.	overcast.
12	,848	,902	84,9	4,7	5,4	73,6	85	80	70	68	,725	,843	89,0	11,5	10,7	71,0	77	54	56	54	72,0	113,0		n.	ne.	cir. stratus.	cumuli.
13	,859	,916	85,9	8,4	8,1	72,8	80	65	66	59	,756	,838	90,8	14,6	14,7	62,3	70	47	40	44	71,2	113,2		nw.	nw.	clear.	fine.
14	,881	,936	85,1	9,7	10,0	69,0	77	60	60	54	,779	,848	89,2	17,0	16,8	62,0	68	37	42	41	70,0	107,4		W.	nw.	do	clear.
15	,897	,932	81,5	13,2	14,0	59,2	72	45	50	46	,785	,837	86,5	18,9	18,8	53,1	60	30	34	31	67,0	101,8		N.	n.	do	do
16	,878	,900	78,5	13,1	13,6	54,6	70	42	46	44	,758	,803	85,4	19,1	19,2	50,2	58	27	32	29	59,8	103,2		nw.	nw.	do	do
17	,910	,935	77,3	9,9	10,8	58,0	77	55	53	54	,780	,836	84,5	15,2	14,6	56,2	68	40	40	41	59,5	112,2		nw.	nw.	do	do
18	,924	,960	80,1	10,3	10,5	61,5	76	55	55	52											61,3	106,8		ne.		do	do
19	,939	,972	77,7	7,6	8,0	64,2	80	52	65	59	,818	,874	84,5	14,5	13,1	57,5	70	42	42	44	61,9	112,0		nw.	n.	do	do
20	,951	,986	79,0	8,9	8,5	64,1	78	60	62	56	,840	,900	85,6	16,2	16,0	59,0	69	37	43	42	63,2	109,4		nw.	n.	do	do
21	,971	,002	80,4	10,6	10,6	60,7	77	55	52	54	,845	,912	84,7	15,5	14,2		71	38		45	61,2	109,2		nw.	n.	do	do
22	,993	,025	79,8	8,4	8,7	65,5	78	60	63	56	,852	,907	84,1	15,1	14,3	57,0	68	40	42	41	61,4	112,1		o.	n.	do	do
23	,936	,978	80,0	10,6	10,5	61,5	77	53	55	54	,801	,864	84,4	14,8	14,0		69	40		42	61,8	116,0		W.	N.	do	do
24	,916	,947	80,1	9,7	10,1	62,8	77	57	57	54	,788	,852	84,3	14,9	13,6	59,2	70	40	44	44	61,8	111,0		o.	o.	do	do
25	,939	,985	80,3	11,6	12,0	59,0	72	50	50	46	,823	,888	85,0	15,6	14,2		68	40		41	63,0	115,5		nw.	o.	do	do
26	,924	,969	79,9	12,6	12,8		72	46		46	,793	,854	84,1	16,8	15,2	57,0	68	34	42	41	58,7	111,0		o.	nw.	do	do
27	,905	,952	79,0	9,4	9,6	65,0	78	57	64	56	,788	,849	84,7	15,7	15,3	57,2	71	37	41	45	68,0	107,0		nw.	nw.	do	do
28	,882	,926	80,4	8,0	8,0	65,2	70	65	61	44	,773	,834	84,7	12,8	12,6		75	49		51	52,5	105,0		nw.	nw.	cirri.	do
29	,883	,927	78,8	8,1	7,6	64,5	67	63	63	40	,758	,818	84,2	11,9	12,0	57,3	76	52	40	52	64,2	103,2		nw.	nw.	hazy change.	fine.
30	,886	,928	79,9	8,3	8,6	65,0	78	62	62	56	,780	,836	84,2	11,8	11,0		77	52		54	66,0	106,8		n.	nw.	cir. cumuli.	cloudy.
31	,891	,936	81,2	8,2	8,3	65,2	81	64	60	61	,782	,826	80,9	5,3	5,0	69,8	88	75	70	74	69,2	101,1		ne.	sw.	cloudy.	showery.
Mean,	29,870	29,911	81,8	9,1	9,3	66,0	77	60	60	55	29,752	29,815	86,3	13,6	12,9	63,1	72	46	48	48	66,4	108,6	0,18	light northerly		steady clear dry weather.	

New Barometer at 10 P. M. 0.039 and at 4 P. M. .063 lower than old standard. The columns of the hair hygrometer are this month entered from a new instrument, the old one being otherwise engaged.—This may cause trifling errors; as its scale has not yet been accurately verified.

JOURNAL

OF

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No. 59.—November, 1836.

I.—*Notice of the* VALLABHI' *dynasty of Saurashtra; extracted from the Buddhist records of the Chinese. By* M. EUGENE JACQUET, *Member of the As. Soc. of Paris.*

A new source of information on the darkest period of Indian history cannot but be most acceptable to all who have perplexed themselves in attempting to reconcile and connect the scattered and contradictory traditions of the Rajpút bards with the inscriptions found in various parts of western India; and to assign specific dates even to sovereigns whose names are most familiar and notorious. While Mr. TURNOUR is throwing light upon the earlier periods of Buddhist rule, from the authentic chronicles preserved among the Ceylonese priesthood, it has been reserved for a distinguished orientalist at Paris to render us an equally eminent service from an opposite and more remote quarter of the globe! M. KLAPROTH's tables of Buddhist chronology, translated from the Chinese and Japanese authorities, had proved the intimate connection that existed between *India, Tibet,* and *China* for the first eight centuries of our era, and had encouraged the hope of gleaning a few cursory notices of the state of the Buddhist portion of the continent of India from the annals of some of their common patriarchs, whose head-quarters were variously located in *Magadha, Capila-vastu, Cabul,* and *Ferghana,* during that long period. More than this is, however, likely to be realized:—the narrations of Chinese pilgrims and travellers have been happily preserved, and, more happily still, have found their way to *Paris,* where alone, perhaps, exists the concurrence of talent and research capable of turning these valuable records to their best purpose. The specimen we have now the satisfaction of introducing to our readers has been elicited,

the author writes us, by a perusal of Mr. WATHEN's translation of the *Gujerát* inscriptions in our last volume,—a translation which M. JACQUET does not hesitate to pronounce " ce que l' on a encore publié de mieux en ce genre dans l' Inde à l' exception peut-être de quelques monuments traduits par votre admirable COLEBROOKE."

We cannot deny ourselves the pleasure of adding his further testimony to the great utility of this important document. " J 'ai été d'autant plus satisfait de voir ce *Shásana* si heureusement interpreté, que je posséde, dans le petit nombre des copies d' inscriptions rassemblées par TOD, un *Shásana* non daté, ecrit dans le même caractére; et que j'ávais dechiffré de maniére à obtenir un alphabet absolument conforme à celui de Mr. WATHEN. C'est encore cet alphabet qui m' a donné le moyen de dechiffrer les legendes des anciennes medailles indiennes, et de reconnâitre le nom alteré de *Chandragupta* dans l'inscription de *Bhilsa,* publiée dans votre journal d'apres le facsimile de Mr. HODGSON."—In fact, M. JACQUET at *Paris* has been pursuing step by step the path we have been following in India; and while this fortunate key has opened to him an insight into the *Bhilsa inscription,* the self-same has led Capt. CUNNINGHAM to discover the titles *Maharája adhi rája,* &c. in the inscription from the *Khandgiri* rock, published in STIRLING's account of *Cuttack.* The copies are both too imperfect to hope for further success until the originals can be re-examined, and this has been undertaken by two friends upon whose zeal we may entirely confide,—Mr. L. WILKINSON of *Bhopal,* and Lieut. KITTOE, whose regiment has just marched to *Cuttack.*

But to return. In addition to inscriptions and coins, we may now look to the geographers and historians of *China,* for an insight into the middle ages of Indian history; and the latter have this great advantage over the former,—that they have scrupulously preserved dates in their records, and that they, as M. JACQUET justly says, " font le journal de l'Asie depuis le second siécle avant notre ère." In his very interesting article inserted in the *Journal Asiatique* on the recent Bactrian and Indo-Scythic discoveries, we are promised further and more copious extracts from the Chinese relatively to *Cabul* and the adjacent countries.—" Les témoignages des auteurs orientaux, et en particulier des historiens chinois, sur les monnaies des différents peuples qui ont successivement occupé les contrées de l'Asie centrale; les temoignages des mêmes auteurs, sur les langues et les écritures de ces peuples;"—these are included among the objects embraced by the learned author in his intended publication, ' *Corpus Inscriptionum Indicarum,*' the appearance of which, our readers will regret to hear, is unavoidably delayed beyond the period at first indicated. It

is only to be hoped that the health of the single individual upon whom this mighty labor has devolved by the lamented death of M. KLAPROTH, will not succumb under so vast and important an undertaking.

We trust no apology is necessary for insertion of M. JACQUET's note in its original language.

ED.

" Je trouve les renseignements suivants sur la contrée de *Vallabhí* et sur l'origine des rois de cette contrée dans la relation d'un religieux Bouddhiste chinois qui visita la Transoxiane, la Bactriane et l' Inde dans les années 632 et suivantes de notre ère.

" ' La contrée de *Fa la pi*, aussi nommée contrée septentrionale de *Lolo*, a plus de six mille *li* de tour. La ville capitale de la contrée a plus de trente *li* d'enceinte. Les productions du sol, les conditions de la temperature, les mœurs, et le naturel des habitants sont les mêmes que dans la contrée de *Ma la pho*. Le nombre des habitants est considerable ; les familles sont opulentes ; on y compte en effet plus de cent maisons qui ont cent *laksha* de fortune ; d' immenses tresors viennent des pays les plus lointains s' accumuler dans ce royaume. On y trouve plus de cent *kialan* (monastères bouddhiques ;) les religieux y sont au nombre de plus de six mille ; ils etudient pour la plupart la section des écritures nommée *la parfaite mesure* qui appartient au petit *yána*. Il y a quelques centaines de temples consacrés aus *dévas ;* les heritiques y sont en grand nombre. Buddha, du temps qu'il etait dans le monde des hommes, a plusieurs fois visité cette contrée ; aussi le roi *Wou-yeon* a-t-il elevé des *sthoupa* aupres de tous les arbres sous lesquels Bouddha s'etait reposé, pour les faire reconnaître. La dynastie actuelle est de la race des *cha ti li ;* l'ancien roi etait neveu de *Che lo 'o ti to*, roi de la contrée de *Ma lapho ;* celui qui gouverne presentement est gendre de *Che lo 'oti to* roi de la contrée de *Kie no kieou tche ;* il se nomme *Thou lou pho po tcha...*"

" Le religieux Chinois ajoute qui c' etait un prince très genereux, très sage &c. car il avait une grande veneration pour les *trois joyaux* (Bouddha, la loi, et l'assemblée.)

" *Fa la pi* transcrit *Vallabhí ;* et *Lolo* लाट *Láṭa* ou *Lára*, la *Larique* des anciens ; *Malapho* est pour *Málava*, et *Cha ta li* pour *Kchatriya ; Chelo ó ti to* est la forme Chinoise de *Shilâditya ; Kie no kieou-tche* celle de *Kanyâkoubdja* ou *Kanoudj :* et *Thou lou pho potcha* répresente regulièrement *Dhrouvabhaṭṭa*. Quant au roi *Wou yeon*, c'est à dire *sans chagrin*, c'est *Ashóka* deguisé sous une traduction Chinoise.

" Je dois d' abord observer que nous avons ici un roi de *Malava* et un roi de *Kányakoubdja* tous deus nommés *Shiladitya ;* (et ils parais-

sent distincts des roix de *Vallabhí* qui ont portè ce nom) qui ne sont pas cités dans les tables genealogiques des rois de l'Inde recueillies jusqu' à ce jour. La relation ne fournit ancun renseignement sur *Shiladitya* roi de *Kanoudj ;* mais on lit dans un autre endroit que *Shiladitya* roi de *Málava* regnait soixante ans avant l'arrivée de notre religieux dans l'Inde. *Dhrouvabhaṭṭa* est certainement le même nom que *Dhrouvaséna ; bhaṭṭa,* et *séna* etant des titres de *Kchatriya,* de même valeur et presque synonymes, qui s'employent indifferemment l'un pour l'autre, sans que l'identité du nom propre auquel ils s'ajoutent en puisse être compromise. La liste genealogique des rois de *Vallabhí,* extraite par M. Wathen des inscriptions qu' il a si heureusement interpretées, nous fait connaitre deux *Dhrouvaséna,* dont l'un est le quatrieme et l'autre le onziême prince de la dynastie des *Bhátárka.* Il n'est pas probable que le *Dhrouvabhaṭṭa* de la relation Chinoise soit *Dhrouvaséna I :* l'inscription que noux connaissons eût sans doute fait mention de l'honneur qu'avait eu ce prince d' être allié à la famille royale de *Kanoudj ;* un etat qui n'avait été elevé au rang de royaume que sons le frére et le predecesseur de ce prince, n'êut pû d'ailleurs être parvenue si rapidement à la haute prosperité et à l'etat de puissance ou le trouva le voyageur Chinois. Ce qu'il rapporte de *Dhrouvabhaṭṭa* s'applique donc à *Dhrouvaséna II,* et l'un des points chronologiques les plus importants de l'histoire de l'Inde occidentale peut être determiné avec assez de precision par cette identification de deux noms dont un est daté. L'inscription publiée par Mr. Wathen, et redigée par l'ordre du septième prince de la dynastie, peut donc étre approximativement rapportée à l'année 550 de notre ère : cette date s'acorde mieux avec les données paléographiques que celle de 328, deduite très ingenieusement d'ailleurs par l'auteur, des traditions singulièrement suspectes des *Djaïna.*

II.—*An account of some of the Petty States lying north of the Tenasserim Provinces ; drawn up from the Journals and Reports of* D. Richardson, *Esq., Surgeon to the Commissioner of the Tenasserim Provinces. By* E. A. Blundell, *Esq., Commissioner.*

[Continued from page 625.]

DR. RICHARDSON'S SECOND VISIT, 1834.

The object of the second visit was to ascertain the truth of the rumours that had reached *Maulamyne,* of some dissatisfaction existing among the Shan traders on account of the bad market they had experienced latterly for their cattle, compared with former years, and to

obviate any bad feeling that might have arisen in consequence. None had visited *Maulamyne* that season, and it was said they declined bringing their cattle down any more. It was important that measures should be adopted to ensure the continuance of our supplies from that country, and Dr. R. was directed to extend his visit on this occasion to *Zimmay*.

He started on the 6th March, 1834, and travelling nearly the same route as that by which he had returned from his first visit, he reached *Labong* on the 1st April, having, when near that place, encountered the same petty delays as before, on the ground of preparing for his reception, and ascertaining from the astrologers a lucky day for his arrival.

"On the 1st of April started in the morning for *Labong*; and though the THOOGYEE of *Passony*[92] was with me at starting, neither he nor any of the neighbouring head-men accompanied me. One man ran before to shew me the road. Reached *Labong* about noon, and on arriving at the temporary houses or *tays*[93], for which I had waited three days, found only three small ones for the people, which might have been put up in three hours. No house for myself, and no one there to receive me. This was all so unlike my reception on my last visit, that I sent the interpreter to CHOW-HOUA to say, if they did not wish to see me, I was ready to return. He assumed anger and surprise that I had arrived without his being made aware of it; said he had ordered the head people of the villages to accompany me, and when half way to run out and let him know, when he would be at the *tays* in time to receive me. The same reason was given for not building me a house, as on my last visit; viz. that as I had a tent, they did not think I would occupy it; but he immediately called the people who had put up the sheds, and gave them orders to set about a house, which they commenced at once.

"The CHOW-HOUA sent some officers to wait on me, with a request to know when I wished to see CHOW-TCHE-WEET. I expressed a wish to see him to-morrow, as the approach of the rains would necessarily make my stay shorter than I wished. I hear loud complaints on all sides of the rascality of the Bengalees who have come up lately from *Maulamyne* to purchase cattle, and the people who last visited *Maulamyne* are very inveterate against the contractor (SHEK ABDULLAH) for supplying cattle to the troops, and declare their determination never to return so long as he continues to be the "*Gomanie*,"—as the first bullocks were taken by the Commissariat on the Company's account; and he being now the only purchaser, they believe him to be the Company, (*Gomanie*).

"On the morning of the 5th, the officers of the court, and some people with silver calats (salvers) for the presents and Mr. BLUNDELL'S letter, came to conduct me to the TSO-BOAS[94]. They preceded me, followed by the people who accompanied me, about 40 in number, dressed in their gayest putsos, thirteen of them each carrying a musket. On arrival at my former place of audience, I found no sheds erected, and that I was to be received in the house (query, palace ?) of the chief. I dismounted at the gate *Chow Rajaboot*; the KEINTOUNG

Tso-boa and others came out half way to meet me, (the whole distance about sixty paces,) and preceded by the letter, (the presents having stopped at the gate,) they led me to a seat on the chief's right. I bowed before taking my seat, and wearing my boots was never objected to. He was seated on a gilded pedestal (*yozaboleen*[95]) about two and a half or three feet high, and before him the chiefs of his principality on carpets spread on the mats with large triangular pillows to lean against, ornamented with gold embroidery. As soon as we were seated, the presents were brought in and placed before him. He put the usual questions respecting the King of England, the Governor General, &c. &c., the length of my journey, and the difficulties of the road; made some excuse for not meeting me on the road; mentioned the death of his son and nephew with much feeling; and expressed good-will and friendship towards us. Indeed, nothing could be more friendly or fatherly than my reception altogether, and certainly with every appearance of sincerity. It was evident at a glance his illness was no formal excuse for not seeing me; he was much emaciated, and evidently very weak. I was seated nearly opposite to the door of the private apartment, which was crowded with women and children, who sent me out a present of fruit. There was no dancing as on my former visit, but a male and two female singers seated immediately within the door of the private apartment, sung a sort of metrical history of the exploits of the Tso-boa and his six brothers, in which the successful insurrection of Kaweela, the eldest brother, against the Burmese sixty years ago, and the carrying off the people from *Kewt-them*[96], *Keintoung*[97], and *Mein-Neaung*[98], by the present chief, held the most conspicuous place; and though many of the unfortunate sufferers were present, any consideration for their feelings seemed never to enter the old man's mind: yet the expression of his countenance and manners altogether is benevolent; which character he bears among the people. The voices of the performers, both in sweetness and compass were, beyond comparison, superior to any thing I have heard out of Europe. After sitting about three-quarters of an hour, he retired on plea of weakness; his feet were swelled, and he tottered a good deal before reaching the door of the inner apartment. After spending some time in conversation with the chiefs I took my leave, intimating my intention of calling in the morning on Chow-Houa, by whom all business is now transacted.

The chief's house is situated near the middle of the town in a large stockade inclosure, and surrounded by a garden. The wooden hall in which I was received is about sixty feet long by thirty wide, and ornamented with three small China chandeliers, some paltry Chinese and India looking-glasses and China lanterns, some of glass and some of paper; a picture of the great pagoda of *Rangoon;* one of a Chinese joss, and a portrait much resembling one of our Royal Family. The most valuable ornaments were the muskets I took up in my last visit, which, with some Chinese-looking scimitars and swords with long silver handles, completed the decorations. The white umbrella was not unfurled; the floor in front of the *yozabollen* or throne was covered by the carpets and triangular pillows of the chiefs, who assume a much more manly position than in the presence of some of the lowest chiefs of *Bankok;* though I am told that next to the Rája of *Ligore*, this is the highest Chief in the kingdom. On the 6th, according to my notice of yesterday, called on Chow-Houa, and had a long conversation on the duties being taken off their elephant-hunters in our pro-

vinces. He readily agreed to the free sale of buffaloes, paying an export duty of half a tical of coarse silver, and reducing that on bullocks to the old rate of one quarter. I brought to his notice the complaints of the Bengalee cattle-dealers, of the refusal of the court-officers to interfere in their complaints against each other, and called his attention to the 10th paragraph of Colonel BURNEY'S treaty of *Bankok* in 1826 on the subject. He complained of the total want of principle in these people, with one or two exceptions, (which all I have heard from themselves tends to confirm;) said he was glad the subject had been mentioned; as, though they had copies of the treaty, they were afraid to punish our people, and had, besides, another difficulty to contend with, in the offenders escaping from one territory to another; and that though they had the power, there was an indelicacy felt in apprehending them in the *Zimmay* district. They had now my opinion that they should act according to the treaty, and would do so in future, and hoped there would be no further cause of complaint. He said he had no objections to the *Zimmay* officers following offenders into this district, and that they would do the same from this; but begged me to impress the necessity of it on the *Zimmay* chief on my visit there, to prevent misunderstanding between relations; as CHOW-TCHE-WEET is now a very old man. I found by this, that the visit I had intimated I intended to make to *Zimmay* was taken as a settled matter, though they had strenuously opposed it on my asking to do so in my last visit.

"On the 10th I received an invitation, or rather a request, from CHOW-TCHE-WEET to attend his son's funeral. He begged I would come early, and see the whole ceremony. I accordingly went at 11 o'clock, and remained till 2. On my arrival, a Pounghee was seated in the centre of the shed reciting, in a monotonous sort of chaunt, a blessing on all present. He ceased soon after my arrival, and a daughter of CHOW RAJA WOONG of *Lagon*, a very pretty girl of 18 or 20 years of age, played for some time on the *ke wine*, (brazen circle,) an instrument composed of small graduated gongs hung horizontally in a circle, in the centre of which the musician sits and beats with small sticks. She played evidently as a proficient. This was followed by a boxing-match, in which the boys, when once come to blows, hammered away at each other's faces much like two little English fellows of the same age. There was a good deal of shuffling before the first blow was struck. They were followed by two men who flourished their arms about within a few inches of each other's faces under a most overpowering sun, for half an hour, without, however, hurting each other much, though they were exceeding serious and intent. CHOW RAJA BOOT then, dressed in a white robe, ascended a small platform about seven feet from the ground, and showered, or rather pelted, a largess amongst the people. On the platform was an artificial bamboo-tree, with perhaps two hundred limes, in each of which was a small Siamese coin of two or three annas hanging from the branches, which he pulled off, and with them pelted the people below;—though there was, of course, great struggling for the limes, there was little noise, and not the least quarrelling. CHOW-HOUA'S wife then begged I would allow the Burmese to exhibit their dance, and as there were two professed dancers of the party and one or two musicians anxious to acquire merit by assisting in the amusement, she was gratified; after which they commenced to drag out the car with coffin. It was burned with rockets in the same manner as a Pounghee,

outside the town, about 4 o'clock; most of the wives of the headmen were present, and the whole of the ceremonies were gone through without quarrel and in great good humour. The deceased was the same whose house was burnt during my last visit here, and who sent out to beg me to look through a small sextant I had been seen using, and tell him who had stolen a ring he lost on the occasion. I left the shed when the coffin was moved, and prepared to start for *Zimmay* in the morning, congratulating myself in getting off a day sooner than I had anticipated; but about 9 o'clock, BENYA TCHE came out to say CHOW-TCHE-WEET begged me to remain one day, as he was anxious to see me to-morrow before starting for *Zimmay*. After many complaints of loss of time and fear of the rains, I was obliged to consent to remain; and on the morning of the 11th, an officer came out to the encampment to say CHOW-TCHE-WEET wished to see me. I promised to wait on him immediately after breakfast. On arriving at the house found a large assembly, and the only communication the old man had to make, was a request to remain till after the new year*, a further loss of three days. I at first refused, but on his urging his request, and reflecting that nothing would be done at either place during the festival, I agreed to remain on condition I was not detained here on my return. The TSO-BOA made some demur, as in duty bound, as a good Buddhist, about the sale of the cattle; he was, however, easily satisfied by transferring the sin to the sellers and CHOW-HOUA, who sanctioned it. He was as kind as usual, always addressing me as his "*luck Chow Engrit*," literally, "son chief English." He talked of a reference to *Bankok*, which I said was unnecessary after the treaty of 1826, and he was again satisfied. He is quite in his dotage, and repeated the same things over and over: the people from their respect for him shew him, however, much consideration. He asked if there was any difference in the value of his presents and those to the *Zimmay* chief, and seemed pleased when told that his were the most valuable.

"After breakfast, on the 13th, two officers, dressed in white robes used in religious ceremonies, came out to my tent by the CHOW's orders, to conduct me where the ceremony on his grandson entering the priesthood was to be performed. I found a large assembly of people in an old *zayat*[99] near the pagoda. The CHOW was seated on a mat near the centre of the place,—the other chiefs near him, his wives behind him—all dressed in white. I found a carpet and pillow for me close to CHOW RAJA BOOT. A Pounghee was seated in the middle expounding the law, and CHOW-TCHE-WEET had told him to continue till my arrival, as he wished me to see the whole ceremony. As I was told I would be expected to contribute, I sent the interpreter to the CHOW with 10 rupees; and he soon afterwards went out to the open space before the *zayat* to inaugurate the boy (about 7 years of age) in his holy office. The ceremony is the same as in Burmah and other Buddhist countries, shaving the head, bathing, investing with the yellow garment. Whilst he was gone, his son told me a Rahan was also to be raised to the office of high priest, *(See-dan)*[100]; that the CHOW before investing him with his office asks him if he will obey his lawful orders; which being answered in the affirmative, he makes over to him all

* I afterwards learnt that the reason of his requesting me to stop was a fear lest I should be insulted, or the people get into any quarrel with the *Zimmay* people, during the holidays at this joyous season.

authority over all ranks of the priesthood. The high-priest then asks the Tso-boa if he will listen to his intercession in favor of criminals condemned to death when it shall appear to him that the punishment is too severe for the offence; to which he assents. On the return of the Tso-boa to the *zayat* he called my interpreter and told him in a whisper the money I had given was too little for distribution, and desired him to ask me for 13 rupees more; which I immediately sent. In the meantime, an old priest invoked a blessing on all present by name, amongst which I discovered my own; and the *Sea-dan* who has been raised by the votes of the priests for his strict observance of the precepts of Budh, promulgated rules and ordinances for their guidance much stricter than those which have been known here for some years, where the discipline has been exceeding lax. Sent the interpreter to inquire how the Chow-Houa, who had been ill, was, and to request Benya Patoon[101] to call on me. The former no better; the latter promised to call in the morning. Benya Patoon called on me this morning; he is about 50 years of age, and an exceedingly intelligent person, His father came originally from *Pegu* to *Zimmay* with about 3000 other Taliens on the destruction of that city by Alompra, A. D. 1757. A short time after their arrival here, an army of Burmans encamped to the northward with the intention of attacking *Zimmay*. The Taliens were promised this,—if they beat off the enemies, they should henceforth live free of taxes. They attacked them, and were successful, and for a time were well treated; but in three or four years, when gratitude began to cool, they were taxed without mercy; and on any expression of discontent, numbers were executed under pretence of secret conspiracy. The Taliens in fear and disgust removed farther northward to *Keintheu* under the Burmese;—the Benya and some other young men went afterwards to *Ava*, from whence he was sent to *Keintheu* on a royal message, and with twenty-five others was caught by a slave-catching party, and from this place sent to *Bankok*, where he soon came into favor with the king, who raised him to his present rank, and sent him up here to look after the Siamese interest at all the three towns. He gives a shocking account of the brutal rapine, and destructive waste of human life in the petty border-warfare and slave-catching incursions all along the frontiers, that has kept down population, laid entirely waste many large towns, and retarded civilization and all the arts of peaceful life in this unhappy country to a degree that could not be exceeded, I should hope, in the annals of any portion of Africa. All of this has been almost entirely put a stop to by our occupation of the provinces on the coast. He gives a somewhat different version of the Cochin-Chinese war from any I have heard. He said the Cochin-Chinese endeavoured to save the town of *Wentian*[102], *Chandapoora* or *Lingen*, when the Siamese attacked it seven years ago. The Siamese would not attend to negotiations on the destruction of the city when horrid cruelty appeared to have been perpetrated. One of the sons of the king found his way to *Hue*. The King of Cochin-China[103] sent an ambassador to *Siam* to say the prince had found his way to him; but as he wished to avoid a war, under certain conditions he would give him up. The Siamese treacherously murdered his ambassador, saying he had given protection and encouragement to rebels. The Cochin-Chinese, enraged at this piece of perfidy, had commenced the war. The latest accounts said the Siamese had the best of it, and were east of the Cambodia river.

"Left *Laboung* this morning (15th), at 6 A. M., and in five hours and a half reached *Zimmay* about N. 30° West of the former place. The Mein Neaung Tso-boa came to see us off, and brought with him a person sent as a guide, though many of the people with me were known to be acquainted with the road. He took us through the fields, a path he evidently did not know himself, under pretence of breakfast being prepared for the people at some village by the way, and I ultimately regained the road by the direction of some Talien people we met. The whole of the road lay through a rich and cultivated country, irrigated by a water-course from the *May-ping*, the main trunk of which is some seven or eight miles in length, and thirty or forty feet in width, by eight or nine in depth, as far as we travelled along the bank of it. At 8 A. M. came on the banks of the water-course, and at 10 crossed the *May-ping* at a ford of considerable breadth, but at this season only reaching to the poney's saddle. On the *Zimmay* side found some officers waiting to conduct me to the *zayat* or *tay*, which we found to be a rattle-trap of a wooden building, forty-five feet by twenty-five, surrounded by an eight feet verandah a foot lower, with four small rooms on each side, in which the people were housed. These buildings shut out every breath of air; which, as the thermometer was 103° at mid-day and 80 at 8 P. M. was any thing but comfortable. The floor was of split planks laid on without rails or fastening, and as the people crowded up to look at me, the rattling was unsupportable. As I would get no relief from this annoyance by complaint, I was ultimately obliged to drive them down by force; after which they did not venture further than the steps of the *zayat*. The *zayat*, which is about a quarter of a mile from the town, was surrounded by drunken holiday-making people, singing, and hallooing, and shouting till about 12 o'clock, one of whom came close to the *zayat* and abused us. My people pursued him to a neighbouring house, which I was just in time to prevent them breaking into, and I denounced the occupier to the police in the morning.

"On the 16th, the brother-in-law of the Chow-Houa and some other officers paid me a visit of ceremony, bringing a present of rice, sugar-cane, &c. with the gratulations of the Tso-boa at my arrival, and expressing his and their good-will towards the English. They remained about an hour. Before they left, I complained of the annoyance of the rabble, which they promised to remove. The forcible ejectment of the rabble yesterday left me at tolerable peace to-day till the evening, when the wife of the Ken-Toung Tso-boa came to visit me, and such a number of women came under her protection that the floor of one of the passages gave way with them, but fortunately no accident occurred. I hear nothing but complaints on all sides of the rascality of the cattle-merchants employed by the contractor to buy his cattle. They are old boat lascars, discharged peons, and thieves from the jail, to whom he has had the folly to entrust more money than they ever saw before. Considering themselves rich, they have bought wives and slaves, and dissipated part of the money; and as they cannot return to *Maulamyne*, they sell the property at what they can get for it. Some of them have picked up the Shan language, and act as interpreters to strangers arriving from the coast, get their property into their hands and appropriate the proceeds. The presents they are enabled to make at this (to them) cheap rate, and the knowledge of the language, sets them above the fear of punishment. On the morning of the 17th, in consequence of my complaint of

yesterday, a person was sent out to keep the people from coming up in the *zayat*, and a writer came to hang up a notice to the same effect. I have been left to myself all day. The poor woman into whose house the person who abused me on the night of our arrival ran for shelter, came to-day to beg my intercession. She is a stranger from *Bankok*, and, as she could not point out the offender, is threatened with a fine. As they have shewn a disposition to punish the person, I promised to intercede for her.

At 10 A. M. on the 18th, CHOW NE NAM MAHA NEUT and some other officers came out to conduct me to the TSO-BOA's house. They proposed that I should halt for some time at the court of justice, which was soon given up on my positive refusal to do so, and I proceeded in the same order as I had done at *Laboung*. The TSO-BOA came in after a few minutes and seated himself on a cushion at the foot of the *zoyabollen;* I was seated immediately in front of him on a pretty large Persian carpet with pillows. I inquired after his health, age, prosperity, &c. and explained the purport of my visit to be a wish on our part to cultivate his friendship and open the gold and silver road, that, as at *Laboung*, we might exchange our superfluous produce to mutual advantage, &c. &c. He replied, that to all proper subjects of traffic there was no restriction. I said I was glad our customs agreed, and hoped that there would be now no further objections to the export of cattle and buffaloes, which was what we principally wanted from this country. The CHOW-HOUA, who as at *Laboung*, transacts all the business, and who is said to be the only one opposed to the trade in cattle, objected on the score of the great mortality which sometimes takes place among them, in which case I observed the price would rise, and still only surplus cattle would be sold; that I did not urge him to give the people an order to sell, but permission to do so. He made some objection, half expressed, on the score of fear of the *Nats* or presiding spirits of the country. I pointed out the fact of their being sold to the Red Careens, to which he made no reply; but, Buddhists as they are, the question of the life or death of the animal has never been mooted by any one except CHOW-TCHE-WEET in transferring the sin of selling to the CHOW-HOUA. The TSO-BOA then heard the letter read, ordered in some sweetmeats, desired us his children to continue our business, and retired on plea of weariness. The hall I was received in, is a brick building about 100 feet by 50; the walls painted with an extraordinary jumble of clouds, trees, temples, &c.; on the window-shutters natives of different countries in the act of salutation. Among others I observed two Europeans in the costume of the time of George II. Below the windows a sea with boats and the white umbrella (emblem of royalty) of seven tiers of coarse cotton cloth, diminishing in size to the top (like an old fashioned dumb-waiter,) was fixed above the *zoyabollen*. I did not ascertain what chiefs were present, but the TSO-BOA and the CHOW-HOUA were the only ones with whom I had any conversation. The TSO-BOA is 80 years of age, but looks much more hale and robust than CHOW-TCHE-WEET. He was raised to the Tsoboaship by the king of *Bankok*, from his merit as a soldier, though he can neither read nor write,—a very unusual thing in this country.

"On my way to the fort this morning I called on CHOW-HOUA, and found him as much disposed to be friendly as he had been the reverse on the two former occasions. He agreed to the trade being perfectly free and unrestricted.

No duty will be levied on imports. The duties on cattle to be as at *Labong* :— elephants one tical; horses free of duty; muskets and slaves are alone prohibited being taken out of the country;—offenders from *Laboung* shall be given up, and the people of this district harbouring them punished. He said our presents of muskets was a certain mark of friendship, and that he intended to send fifty cattle to the Commissioner; and as I could not take them with me, he requested that I might arrange to leave some one to take charge of them.

"24*th*. I went to take leave of the Tso-boa, who received me nearly alone in an outer hall; gave me the letter for the Commissioner, and was most friendly in his professions. His house consists of three wooden ranges of about fifty feet wide, (their length I could not see,) the brick hall standing across the ends, in which I was formerly received, and the small one in which I saw him to-day. Soon after my return to the *taydau* or *zayat*, Chow Maha Neut came with a message from Chow-Houa to set my mind at ease regarding the cattle and trade generally; that every facility should be given to purchase cattle, and the trade should be perfectly free and unrestricted; that it was not becoming to be bounden by promises, but that we would see hereafter the strength of their friendship. He regretted that he had not seen me on my last visit, that my stay this time was so short, and requested I would return for a longer stay next fine weather, &c. &c. I left *Zimmay* at half past 4 p. m. on the 24th, and reached *Labong* at 10. The walls of the inner town of *Zimmay* are 800 fathoms from east by west and 1000 from north to south, all of brick, and a ditch and rampart all round. The outer wall, which reaches from the north-east to the south-west corner, is circular and upwards of 1800 fathoms, one-half of brick, the other of wood with a rampart round the brick part, and a ditch surrounding the whole. The ditches when in repair, (which they do not appear to be now,) can be filled from the river. The town is situated four or five miles from the eastern foot of the *Bya-tha-Dyk*[104] hill, the highest in the range, and between it and the hill is another small single-walled fort about the size of *Laboung*, called *Moung-Soondank*[105], (city of the flower garden.) All the houses in *Zimmay* above the poorest of the people are surrounded by compounds fenced in, in which are cocoanut, arica, betel, bamboo, and other useful trees, with a great variety of flowers and flowering shrubs, which are watered by a stream of clear water brought from the hill. The valley in which this town and *Laboung* both stand, is little less than one day from east to west, and little more than three from north to south. Much of the valley near the town is under cultivation, which is all prepared by irrigation, and the grain is transplanted, yielding upwards of one hundred-fold, though the fields are never left fallow."

Dr. R. quitted *Laboung* on the 29th. On the 9th May the rains set in, and continued almost without intermission during the remainder of his journey. He arrived at *Maulamyne* on the 21st May, suffering greatly from the exposure; most of his followers ill, (several of them died shortly after,) and the elephants completely knocked up by the difficulties of the road.

Dr. Richardson's third visit, 1835.

Dr. R. was directed on this occasion to extend his visits to some of the other Shan States, and also to the tribe of Red Kaffens[106] on the

west bank of the *Salween*, who, sometime previous, had sent a message to *Maulamyne* to say they should be glad to see an European officer in their country, and to open an intercourse with us.

Dr. R. started on the 29th December, and arrived at *Laboung* on the 26th January, 1835. Here he found that his old friend the "CHOW-TCHE-WEET," or "Lord of Life," was dangerously ill. The old man received him, however. Dr. R. says—"On entering his house, I found the chiefs and elders assembled and a curtain across the room. After some conversation, chiefly regarding the war to the eastward and the great blessings conferred on this country by our occupation of the Provinces, the curtain was drawn aside, and showed us the poor old man evidently on his death-bed, with his children and grand-children around him. He spoke but little; said he was glad to see me again, and handled one of the muskets I had brought with me to present to him."

After staying a few days at *Laboung*, Dr. R. proceeded to *Zimmay*. Here he had some long discussions with the CHOW-HOUA of that place relative to some impediments and restrictions he had placed on the trade in cattle, and to some late attempts on the part of the frontier Shan petty chiefs to levy tribute on the Kayens residing on our side the boundary river. These matters were, however, amicably adjusted, and much kindness and attention were shown him. It was the period of an annual festival, for which he was urgently pressed to stay. He says—

"One of the amusements at this festival was the letting off of large rockets—each rocket being honored with some name, and supposed to appertain to some chief or great personage. One was appropriated to me; and my coolies and servants being joined by a number of *Maulamyne* traders then in the place, who entered into the spirit of the thing, my rocket was well attended to the ground with dancing and singing, to the delight of the Shans, to whom Burmese music and dancing was quite a novelty. The rockets were all of wretched construction, but it so happened that mine performed its duty in a style infinitely superior to any on the ground; and such is the superstition of these people, that I feel confident this incident has made an impression on their minds of the superiority of our nation which will not easily be effaced."

Here Dr. R. met a large portion of the annual caravan of Chinese traders, of whom he says—

"At *Zimmay* I found the caravan of Chinese traders, consisting of 200 mules and horses. Three hundred more were said to be at *Moungnan*, where cotton is abundant. They had arrived in the country a considerable time before me, and were preparing shortly to return home. I had a good deal of conversation with the two heads of the caravan, who seemed to be intelligent, enterprizing characters. They said they had long entertained the idea of visiting *Maulamyne*: and now that they were invited to do so, and were assured of protection, they would

undoubtedly do so next season ; the present one being too far advanced to allow of their increasing their distance from home. They requested that an interpreter should meet them at *Zimmay ;*—and from their repeated requests that he should be at *Zimmay* in all November, in order to accompany them down, I feel convinced these people will be at *Maulamyne* before the end of the year. With the chiefs I found no difficulty whatever in obtaining their consent to their passing through the country : no objection was ever hinted, nor have I reason to expect that any will hereafter arise.

" The imports by these caravans consist of copper and iron vessels, silk, (raw and manufactured,) satins, gold and silver thread and lace, musk, walnuts, carpets, and vermilion. They export from the Shan country cotton, ivory, skins, horns, &c. &c. From the information which I could collect, the caravan assembled at *Moungkoo*, distant from *Zimmay* about two months' journey. Their goods are conveyed by mules, and they would appear to travel rapidly ; as they asserted they would not be more than twelve days from *Zimmay* to *Maulamyne**. They allow nothing to detain them on their journeys. If a man fall sick, or is disabled, he is left behind ; and if one dies, they do not even stop to bury him, but cover his body with a cloth and continue their route."

Dr. R. left *Zimmay* on the 23rd February for *Lagon*,[107] a town he had not hitherto visited. The following is his route :—

" 23*rd*. Direction S. 65 E. Distance, 5½ miles.

" Started at 1 P. M. and reached *Paboung*[108] at 3. 30. This is a small village of only twenty-four houses, but the Thongyee, or head-man, has altogether about three hundred houses under his jurisdiction. The road was level, through paddy fields, intersected by small slips of jungle.

" 24*th*. Direction S. 20 E. Distance, 16½ miles.

" Left *Paboung* at 7. 35. At 9 crossed the *May-quang*, which runs past *Laboung* and falls into the *Moypiny* to the southward. At 11. 40 we halted at the village of *Ma-wan-tchay*[109]. The road throughout the day was good and pleasant ; considerable cultivation, and the inhabitants numerous. The people of the village where we have halted are all captives from *Mein Neaung*, who, never having seen an European, were very curious, but, at the same time, exceedingly civil and hospitable, having provided a dinner for my followers. An old man of the village remarked to me, after we had been encamped a few minutes only, that a Burman chief, travelling as I was doing, would ere this have tied up and flogged some of them to shew his authority, and that neither he nor his father had ever heard of a person travelling through a country merely to make friends. He wished I would open the road to his native place of *Mein Neaung*.

" 25*th*. Direction S. 20 E. Distance, 13 miles.

" The road to-day was through a teak forest and over several small hills lying from a few yards to a mile distant from each other. Our guide to-day was a Doctor, who was quite an amateur in his profession, and spread out all his medicines under a tree and began prescribing gratis for our people. He had in his store of medicine the thigh-bone of a dog, the jaw of a monkey, the vertebræ of

* A small party of them have since arrived at *Maulamyne* in company with the men sent to meet them. They made the march in 15 days and express themselves satisfied with the market here.

a fish, part of a grinder of an elephant, the fore-tooth of a rhinoceros, some bone of a turtle, and two or three pieces of broken china. The rest of his collection consisted of little bits of sticks, and roots of all colors, to the number of two hundred and eighty-one, (I had the curiosity to count them,) the names and virtues of all which he professed to show. Not the least curious part of the collection was his mortar or substitute for one ; it was a turned wooden bowl ten inches in diameter, with a handle to it, and inside opposite the handle a piece of coarse flinty sandstone fixed with lac about four inches square, and sloping towards the bottom of the bowl : on this the various articles are ground down, in sometimes a quart of water if the patient is very ill.

" 26*th*. Direction S. 70 E. Distance, 16 miles.

" The road to-day was very tortuous and in some parts steep and rocky. No inhabitants or cultivation were to be seen.

" 27*th*. Direction East. Distance, 15 miles.

" Started at 7 A. M. March lay along a good road in the jungle till 8. 30 when we passed a last year's clearing with buffaloes and other signs of inhabited country. At 8. 45. crossed the *Maytan*[110], a considerable stream in the rains, now not ancle-deep, and on the eastern bank at *Ban-hang-sat*[111], a village of some size ;—found they had received orders to have breakfast ready for the people, which was fortunate, as there was not rice for half of them at starting. Here we halted fifty minutes under the tamarind trees, whence two hours marching brought us to *Boutue*,[112] on the banks of a stream of the same name about the size of the *Maytan*. The road has been good throughout and the country level. The people of this village have orders to supply us with every thing, and take us into the town to-morrow ; they brought out dinner for the people soon after our arrival,—rice and vegetable stews, ready cooked, each house furnishing a portion, as is the custom in Burmah. These were brought out by the women of the village, young and old ; the former, as usual, uncovered to the waist, and finer busts are not to be found in the world, and many of them fair as Europeans.

" 28*th*. Direction S. 70 E. Distance, 4 miles.

" Reached *Lagon* at 8. 20 A. M. There are three towns close together, two on the north and one on the south side of the river *Moy-Wang*, [113] in the last of which most of the chiefs live. The river between the towns has a course nearly east and west, and, dividing, forms a little sandy island nearer the south side, on which sheds had been prepared for our reception. The whole breadth of the river is about one hundred and forty-seven paces, but at this season there are only two small streams near each bank about knee-deep. During the rains even, it is seldom full, and consequently for the greater part of the year is not navigable for boats of any size. Neither is it favorable for purposes of irrigation, and as the rains are often insufficient, it is a far less favorable site for a town than *Laboung* or *Zimmay*, though containing an equally numerous population. As the trees in the town and neighbourhood are luxuriant, and the soil generally appears productive, it is probably the fault of the people themselves that provisions are scarce."

The following are Extracts from Dr. R.'s Journal during his stay at *Lagon*.

"*3rd March.* Visited several of the chiefs to-day. They all expressed themselves most friendly to us, and spoke openly of a different feeling existing at *Zimmay*. As my visit was entirely conciliatory, I avoided the subject, merely saying, that we were grateful to our friends, and that I believed the general feeling of the people of *Zimmay* was friendly towards us, in which they agreed, and said they saw I was aware where the bad feeling lay. I spent several hours with the several chiefs, and altogether passed a very pleasant day, owing to their kind reception and the absence of all ceremony.

"*4th.* Went over to one of the towns on the north side of the river to visit a chief residing there. The whole of the town is enclosed within old walls, the river face of which is mud, the remainder brick, but in a very ricketty condition. The paths from one house to another, which are all far apart, are more like the paths in a common village than the streets of the town.

"*8th.* There are fewer elephants here than at *Zimmay*. The king of *Siam* called for a return of these animals last year, when three hundred were found here and near one thousand at *Zimmay*, large and small. I learn that there are no taxes on specific articles here. Every cultivator, without exception, at the close of the harvest, pays into the Government granary a quantity of grain equal to what he may have sown, and each house pays half a tical of coarse silver on account of sacrifices to the *Nats*, or protecting spirits of the country. These sacrifices are another name for public feasts as the buffaloes, pigs &c., together with the spirits that are provided, are consumed by the people. The land is the property of him who clears it, and any one may cultivate unoccupied land, provided he pays the accustomed contribution to the public granary. The person so clearing and cultivating land may dispose of it in any way he likes, and cannot be arbitrarily dispossessed of it by the chiefs, as in Burmah the people are glad to place themselves under the protection of some chief and become followers of his family. They work for him, and are often sent by him on trading excursions, receiving occasionally a portion of the profits.

"10*th.* Received a visit from No. 1 wife of the CHOW-HOUA, accompanied by her two daughters and several female attendants. She says she will be obliged to leave her daughters behind when she accompanies her husband to *Bankok*, (whither all the chiefs are bound, on the occasion of CHOW-TCHI-WEET'S death,) as the king might take a fancy for one of them. This, she said, would be all very well for a year or two, after which she would be discarded and neglected, and then her life would be one of misery."

Dr. R. left *Lagon* on the 10th March, and arrived at *Laboung* on the 13th, a distance of 44 miles ; direction N. 70 W.

"Here I found the chiefs of all the associated States, assembled to perform the funeral rites over the body of CHOW-TCHE-WEET, the acknowledged head of their family. I had to enter into long and disagreeable discussions relative to the three elephants which had been stolen at *Maulamyne* on several occasions, and which had been traced to *Laboung* and the thieves discovered. The difficulty arose from the thieves being proteges or dependents of CHOW-HOUA of *Laboung*, who alone opposed restitution of the property, or the punishment of the thieves. I at last threatened, that unless I could report that this business was satisfactorily settled, it would be referred to *Bankok*. This alarmed them

as, under present circumstances, they must deprecate any reference against them to the king of *Siam*, who might take advantage of the opportunity to place a stranger in the situation of the deceased chief. Still the settlement was put off till the arrival of the chief of *Zimmay*, who had returned to his town for a few days, and I was obliged to quit without knowing the result of their deliberation. I learnt, however, by a messenger who met me on my return from the Red Kayens, that the affair had been terminated to the satisfaction of the owners of the elephants, who had accompanied me from *Maulamyne*.

" At this assembly the chiefs seemed on very bad terms with each other, and their deliberations were conducted with much acrimony, and on one occasion with personal violence. The CHOW-HOUA of *Laboung* appeared to have given general dissatisfaction, though he again was full of complaints against the others. This mutual bad feeling was shewn in the inditing of the letter brought by me from the chiefs of *Laboung*. I was informed by one of them, that when it was read to CHOW-HOUA, he ordered his name to be struck out without assigning any reason. When I called on him to bid him farewell, I asked him why he had done this. He begged me to be assured that no disrespect was intended by it; that the letter had been written without, in the least, consulting him; and though it was a very good letter, yet he declined to have his name in it under such circumstances. He then went on to say, that the death of the old man, whose obsequies they were then celebrating would, he feared, be the cause of much evil and misery to the country, owing to their own dissensions.

" Having at last obtained the letter, and having been furnished with an order for guides from the frontier to the Red Kayen country, I left *Laboung* on the 25th March."

The route usually travelled from *Laboung* and *Zimmay* to the country of the Red Kayens on the west bank of the *Salween*, is through *Mein-loon-gyee*, towards which Dr. R. bent his course and arrived on the 31st March. Here he remained one day in order to procure rice and other articles for himself and followers during the remainder of the journey, as no villages would be fallen in with for some days.

" *April 2nd.* Direction N. 15 W. Distance 15 miles.

" The road lay generally along the banks of the *Mein-loon-gyee* river, crossing occasionally from one side to the other and through a magnificent teak-forest.

" *3rd.* Direction N. 39 W. Distance, 20 miles.

" The road much the same as yesterday's march. Crossed the river twelve times during the day with the water sometimes over the saddle flaps.

" *4th.* Direction N. 75 W. Distance, 17 miles.

" Left the *Mein-loon-gyee* to the eastward, and proceeded along a road of much more rugged character, up a small stream which we crossed seventy or eighty times. The hills are here more close and precipitous, but the tops of many of them are cleared for grain cultivation, the only sign of the country being inhabited. Met fifteen elephants returning from the country we are about to visit, with stick-lac.

" *5th.* Direction S. 80 W. Distance, 12 miles.

" Crossed the highest part of this range at 7 A. M. from whence the water

runs westward into the *Salween* and eastward into the *Mein-loon-gyee.* The road to-day has been the worst we have travelled ; the hills very trying to the elephants, and the stony banks of the streams to the horses' feet. Met two poor little children recently purchased from the Red Kayens ; one for six bullocks ; and the other, a very interesting child, about 7 years of age, for 10.

" 6*th.* Direction W. Distance, 11 miles.

" First part of the road over a steep hill ; remainder over low land covered with grass, formerly cultivated.

" 7*th.* Direction W. N. W. Distance, 15 miles.

" First part of the road the same as the last of yesterday's, along low reedy ground, following the course of an inconsiderable stream. At 8. 30 came to a pass between two hills, which, in case of attack, is defended by the Kayens by securing large stones with ratans and bamboo work on the tops of the hills ;— the ratans are cut, and the stones roll down on the invaders. It is about one-fifth of a mile in length.

" 8*th.* Direction W. N. W. Distance, 12 miles.

" The country more level, with some occasional clearings and a few houses. The jungle to-day was unusually alive with pheasants, pea-fowl, partridges, &c.

" 9*th.* Direction W. Distance, 14 miles.

" The country of the same character as yesterday. Halted on the banks of the *Salween* about four hundred yards wide, running a rapid stream in a narrow valley or ravine, except at the small plain where we are encamped, and another on the opposite side on which stands the village of *Banong* [108] or *Yougong*, consisting of about twenty-five houses, having the appearance of a common Burman village. Met 20 or 30 bullocks to-day with stick-lac and eight slaves en route to the Shan country, making in all fifteen since leaving *Laboung.* One family of four were bought for ten bullocks, the father and mother and two children two and three years of age. There are some others for sale at the village. In the evening the son of PHA-BHO, one of the chiefs of the Red Kayens, an exceedingly dirty, stupid-looking lad of about 18 or 20, came over with a relation who is headman of the village. They appeared to have some difficulty in making up their minds who was the proper representative of the tribe. At last it was decided that PHA-BONG was too young and comes to PHA-BHO to consult on state matters ; and that as PHA-BHO was the person who sent the message last year, it is determined I shall go to him. He resides three days' journey on the other side of the river. There have been about fifty or sixty Kayens about my tent this afternoon, (none of them appeared to come avowedly as the young gentleman's attendants ;) they do not differ at all in personal appearance from the common Kayens of the hills, except that they are perhaps less good-looking. Their dress consists of a pair of short trowsers of generally red (particularly the chief's), colored cotton of domestic manufacture, coming about half way down the thigh, and every one had either a piece of book muslin or an English cotton handkerchief round his head.

" 10*th.* Waited some time for the boats. At last the young lad of yesterday crossed over, and on my interpreter complaining to him of the delay, he said the Kayens were never in a hurry. He succeeded, however, in getting them at 12 o'clock, and every thing was crossed over that evening. We were in apprehension of a scarcity of provisions, as the old head-man of the village declined

supplying any. PHA-BHO's son however, procured some rice ; as to eggs or fowls, they were out of the question.

" 11*th*. Direction N. W. Distance, 9 miles.

" The road to-day was either rocky or covered with round water-worn pebbles, and lay among low rocky hills scantily covered with vegetation and stunted scattered trees. PHA-BHO's son was engaged in eating a buffaloe, which he had sacrificed to the *Nats*, and did not accompany us. He sent a guide, however, and is to follow us to-morrow,

" 12*th*. Direction W. N. W. Distance, 15 miles.

" First part of the road rocky and bad as yesterday, but the latter part more level and less stony. Passed one or two small villages, around which was a little of the most slovenly cultivation, chiefly *cholum*. Halted at the village of *Bantoe*,[109] of about thirty houses under the nephew of the last PHA-BANG (a chief's title). At this village there was a poor woman brought in two days ago, from a party of about three hundred people seized by PHA-BHONG from the village of *Tongpak*[106] (Burman Shans) which they left a smoking ruin a few days ago. The story which she told in the fullness of her grief is replete with all the horrors that are attendant on such diabolical scenes. The Kayens attacked the village, it appears, with bravery, (but the Shans are cowards,) and her husband was cut to pieces in her arms, and she kicked by the savages from his bleeding body. Many of the Kayens were killed, but they succeeded in carrying off all the inhabitants. She saw her two daughters in their rapid flight, but was separated from them two days ago. The respectable individual at the head of this village took her as his tenth of the captives taken by his people. She does not know where her daughters are carried to. What adds to the helplessness of her situation, is that she is far gone with child, and is the only one of her village here.

" 13*th*. Direction N. W. Distance, 14 miles.

" Reached PHA-BHO's residence (called *Dwon Talwee*)[110] to-day after travelling over a succession of hills on the worst possible road.

" 14*th*. Sent into the village to say I wished to-day to deliver the letter and presents from the Commissioner, and PHA-BHO requested me to come when I felt inclined to do so. I accordingly went in after breakfast about two hundred yards to the village, which consists of seventy houses in the worst Burman style, the chief's much the same as the rest, but made of wood split and fastened together by wooden pegs. There is a sort of open verandah, if it may be so styled, without a roof, at which we arrived by a rough sort of wooden ladder of six or eight steps, all of which were loose. Here we stooped under the roof which reaches within four feet of the verandah or platform of loose boards, and two paces brought us into the door of his Majesty's mansion, from which one step landed us to the royal presence. This, however, I did not for some time discover, as the door at which I entered was the only opening in the room, or rather house, except the crevices between the boards, so that for some minutes after entering it was perfectly dark. I could absolutely see nothing but a little bit of fire that was in the middle of the floor. I seated myself on a carpet, and the people groped their way in with the presents, and after sitting a few minutes I was able to distinguish by degrees objects in the room ; not, however, so as to have recognised the old gentleman if I had met him ten minutes afterwards

in the day-light. I told him I had come as he had requested, and as the Commissioner of *Maulamyne* had promised last year, from whom I had brought a letter and presents, and wished to open the gold and silver road between us, and be friends with the Kayen nation, &c. &c. He gave me an opportunity of talking, as he said nothing for a quarter of an hour. At last he requested to have the letter read and explained, which was done. He then said his object in requesting an officer to visit him was to know if the English would form an alliance with him,—for the purpose of making war on the Burmans! I declined the honor of a warlike alliance, but told him our views were all peaceable, and that we never made war unless injured, when vengeance was instantaneous. I begged his protection for our traders, &c. &c. &c. He said if we would not make war along with him, he must make friends with us, nevertheless ; but that war with the Burmaus was his object in asking a visit, and that he would send for some chiefs from *Ngoay Doun*, and make known my visit, and the wish for a friendly intercourse. He promised his protection to traders, and was as friendly as possible. By this time I could see the size of the room—it was about thirty feet by forty, and a bow end where the door entered. The fire was in the middle of the room on a little square place insulated from the floor, being raised an inch or two from it and supported from below, the roof splendidly varnished with soot. The old man was alone when I went in ; the room was, however, soon crowded, but their whole demeanour was civil and respectful,—very different from what the *Zimmay* chiefs wished me to believe. In the evening the old man's factotum came out to beg me to delay six or eight days, which I declined, and begged to be dismissed on the 17th. This old man, who is an up-country Shan, after giving a splendid account of the numbers of the Kayens and size of their towns, said some of their towns had four hundred houses, and the country was six days' journey from north to south, and four from east to west. PHA-BHO discourages men-catching, but the people pay no regard to his counsels. There is something like law amongst them ; for, on inquiring the cause of the firing of muskets that took place this morning, I was told it was a robber who had been ransomed by his friends for two *ketsees* [111] (copper drum, a sort of gong) and 100 tickals coarse silver. Found our height by the thermometer to-day to be 1021 feet. The flat on which we are encamped, and on which the village is situated, is about 610 paces wide and 600 or 650 long. There is another about 600 feet higher of the same size, and still further up is a third platform 2049 feet above the sea and about two miles square, perfectly level, with rich soil, all under cultivation, watered by two streams which rush down the perpendicular face of the mountain from above and irrigate the two lower platforms. The mountain is of limestone, and its steepest acclivity appears to be on this side, though the presence of the beautiful stream on this face would indicate the country.

" 15*th*. Had a visit from the old chief to-day, a dirty shabby old Kayen when seen by day-light. The only indications of his chieftainship were a gold sword and a silver betel-box, both of which he carried himself, and his only attendant was the old Shan mentioned yesterday. He was as silent as before for sometime. He at last began to speak, and continued talking for about an hour of the origin of the human race, to prove what I had said (on his questioning) that the English were the most powerful nation in the world, to be incorrect, or at

least uncertain. The pith of his story was, that we were all originally descended from PHA-BEE, a lady who lived at *Ava*. Who our other venerable progenitor was, he did not know, or how the lady happened to come into the world: however, she had three sons, the elder the father of the Chinese, the second of the Kulas (all people not Chinese, Shans, Burmans, or Kayens), and the third of the Kayens. Of the country from which these ancient gentlemen obtained helpmates, he was ignorant. This story was altogether imperfect, and the interpreter a wretched one. However, there is a pagoda some days from this to the northward, on which no nation has yet appeared with sufficient power to put the *Tee* [112] or ornamental covering, on the top; but there is to be a great feast and gathering of all the nations to take place, which he expects every day to be called to attend, when this will be achieved, and a *Natthamee*, or female spirit, will descend, to whom the Chinese, Kulas, and Kayens will each believe their claims equal, and will fight till they are up to the knees in blood. The demi-goddess will then inquire what is the matter. On its being explained, she will end the contest by espousing the chief who can *draw her sword*: it will then be known which is chief amongst nations, till which time he will not believe that we are much more powerful than the great nations named above, especially the Chinese. The magnificence of my tent and brass-bound bullock trunks had, however, their weight with him. He did me the honor to remain four of the longest hours I have spent amongst many very protracted ones in my present mission. He, however, as an equivalent, promised his protection to traders from *Maulamyne* and to people (Chinese included) from the northward, but was afraid they would not find provisions, which will be somewhat difficult, even if he has sufficient influence with his savages to prevent their molesting them. Some of our traders from *Maulamyne* came in to-day (ten) who had gone into the Shan territories subject to *Ava* to the north-east, where they had disposed of their cotton goods to some profit in exchange for horses. They met the Chinese traders who annually visit the town of *Mank Maie* [113], (which is only four days' journey from this,) who had expressed a wish to come to *Maulamyne*, and probably would accompany any of our people who may be there in proper time next year, unless deterred by the terror with which these detestable savages have inspired their neighbours, though I am convinced they are equally despicable and detestable.

"16*th*. Several of the head people came out to the tent this morning, and in the evening I went to take leave of the head-man. They were vociferously discussing the propriety of returning a present to the Commissioner. As soon as I could obtain a hearing, I repeated all I had previously said about the traders, and was begged to explain to the traders coming here that they must not take forcibly what did not belong to them; they promising to do all on their part to protect them if their conduct was correct, but could not be answerable for offences beyond their jurisdiction. They would tell them where they might go with safety; if they went beyond that, it must be at their own responsibility. The discussions were renewed more loudly than before, and I took my departure with a head-ache, partly from the noise, partly from the vile smell of the house. As the grand distinction between the chief and others is his not eating rice, the half of the room was filled with yams, some growing, some putrid and highly offensive After I had returned some time, the old Shan came out and said, the chief wish

ed to know distinctly if we considered him our debtor for the things I had given, as he feared it might be brought against his children or grand-children; which is by no means a groundless fear amongst themselves, for I saw on my first visit to *Zimmay* a little child who had been seized and sold by a creditor for a debt contracted by his grandfather for a gong. I assured him his fears were perfectly groundless, and explained what was usual in other countries. He wished me to remain tomorrow, on the chance of his getting a horse to return for the presents. As we have the greatest difficulty in getting—in fact cannot get—rice, and should we be caught by the rains on this side of the eastern hills, we shall be obliged to halt without provisions till they are passable, I intimated my positive intention to start with the moon-light early in the morning to save the elephants crossing the hills in the heat of the day.

"17*th*. Last night at 11 o'clock the old Shan came out according to his promise, bringing a letter for the Commissioner written on two shabby leaves of an old Burman black book, and a little pony, for which my servant had been bargaining in the course of the day; its price was about forty-five rupees. I believe a man from *Maulamyne* who was robbed and is now seeking justice here, was the writer of the letter; and as they have no written character of their own, it was written in Burmese."

Dr. R. quitted *Daung Talwee* this day, and arrived at *Maulamyne* on the 10th May, having returned through *Mein-loon-gyee* by the route already described. He thus sums up the result of his last mission:—

"I need not descant upon the great importance of opening a market with the frontiers of *China* for British goods by means of the caravans of Chinese traders. It is probable that on the first visit of these people to *Maulamyne* their numbers will be few, but when once aware of the safety and freedom from all vexations and exactions with which their visits will be attended, and of the extensive market existing for their goods, I think there can be no doubt we shall see them here in future years in great numbers. I learnt from the people, and also from other quarters during my travels, that no difficulty would exist in our traders visiting the frontier towns of *China*. The Chinese asserted there were no guards and no restrictions in their towns, and a person of some rank at *Labon* pressed me to accompany him next year on a trading expedition in that direction. I cannot but think this subject is worthy the consideration of Government; and should any thing of the kind be deemed advisable, I should be most happy to offer my services.

"An extensive opening for our inland trade has been made by securing the good-will towards us of the Red Kayens, and it is possible that the intercourse with these people now commenced may lead eventually towards their civilization, and that our influence with them may hereafter be successfully exerted in putting an end to their system of kidnapping and selling their neighbours which now forms their, I may say, sole occupation. I learnt that from three to four hundred unfortunate beings are annually caught by these people, and sold by them into perpetual slavery. I met many of them on my journey,—some just purchased, others on their way to be sold.

"The kind feeling of our north-eastern Shan neighbours towards us, have been increased by my late visit. The mixture of firmness and conciliation which

I had it in my power to exhibit towards them on the points discussed, has tended to convince them that we are firm and consistent friends, not desirous of aggrandizing ourselves at their expence, but at the same time not to be imposed on or trifled with."

III.—*Notes on the Antiquities of Bámián.* *By* C. Masson.

Bámián is situated in one of the *Paropámisan* valleys, distant about 80 or 85 miles from *Cabúl*, bearing N. 75 W. The valley is deep, the enclosing hills on either side exhibiting, to a greater or less extent, perpendicular walls of rock, whence their convenience and adaptation for the construction of caves. The rock is called *Mung*, being a conglomerate of small pebbles, sand and divers colored earth, remarkably compact and hard. The length of the valley is about nine or ten miles, in direction from east to west. Its breadth is inconsiderable, but greatest at the particular spot in it, pre-eminently called *Bámián*, and where the statues and principal caves are found. At this point also the streams of *Súrkh Dur*, and *Júí Foládí*, by their junction, form what is called the river of *Bámián*, which flowing eastward down the valley, receives at *Zohák* the waters of *Kálú*, after which winding to the westward of *Irak*, *Búbúlák*, *Shibr*, *Bitchílík*, &c. and augmented by their rivulets, eventually escapes from the hills, and passing *Ghorí* falls into the river of *Kundúz*.

The appellation *Bámián* may perhaps be equivalent to high region in contradistinction to *Damián* or *Damán*, the low region, or that at the skirts of the hilis—"Bám" signifies "roof," and when it is remembered that Asiatic roofs are flat, as are in general the summits of the mountains in this part of the country, we are at no loss to account for the name, once probably universally applied to it, though now retained by a particular locality;—and when we further consider its elevation above the surrounding regions, we may admit the figurative and emphatic interpretation of *Bámián*, as afforded by some of the inhabitants, who render it the "roof of the universe."

The mountains among which *Bámián* is situate, are no doubt those designated by the Greek historians and geographers *Paropámisus*, as opposed to the true Indian Caucasus or *Hindu Kosh*, from which they are distinct. The term has been cavilled at, but without justice. It was no creation of the Greeks, but the native name for the hills; nor need we doubt this, when we find it made up of *par* and *pám*, signifying "hill" and "flat." *Paropámisus* may therefore be translated the region of flat summitted hills, and is a term peculiarly appropriate to the countries on which it was conferred. Know-

ing the etymology of *Paropámisus*, we learn that of PAMIR, the lord of hills.

The principal antiquities of *Bámián* are its idols and caves, which have manifestly a connection with each other,—the castle of *Zohák*, so called—and the remains of the city and citadel of *Ghúlghúleh*.

The evidences of *Ghúlghúleh* are numerous and extensive, proving that it must have been an important city. Refraining from speculation as to its origin, we know from authentic history that it was destroyed by GENGHIZ KHÁN in 1220, A. D. The natives of *Bámián* have a tradition, that it was re-edified, and again fell into decay—which is probable, there being many Muhammedan tombs referring to it, which have a less antiquity than six centuries, if painted glazed tiles to be seen in them, were confined to China, until the era of GENGHIZ KHÁN, as supposed by some authors. The most striking of the remains of *Ghúlghúleh* is the citadel or place, the walls of which encompass an isolated eminence.

The fortress of *Zohák*, so called by the natives and by ABUL FAZIL, occurs at the eastern extremity of the valley, where the rivulet of *Kalú* falls into the river of *Bámián*. We have not inspected it with sufficient attention, to decide upon its character, or to venture to advance an opinion on it, which future research may controvert—we therefore merely observe that, agreeing with ABUL FAZIL as to its antiquity, we differ both from his notion and that sanctioned by tradition that it was a place of defence.

The caves of *Bámián* are found in the cliffs or perpendicular fronts of the hills on either side of the valley, and on the northern side they uninterruptedly occur for a distance of six or seven miles. At the spot called *Bámián*, the elevation of the cliffs, being most considerable, there are found the greater number of caves, or *samuches* as called in these countries, congregated as in a focus. Among these caves stand in niches the two large idols long known in Europe, and between them are two other niches, in one of which are the fragments of a former idol, and the other as certainly once contained one. Opposite to these, diverging to the south-west is the valley through which flows the rivulet of *Júí Foládí*, and eastward of the citadel of *Ghúlghúleh* is a valley stretching to the south—the hills to the north and east of both these valleys are also perforated with caves, and among those of the latter is a large idol inferior only in size to the two superior ones at *Bámián*.

The idols are cut or hewn in the rock, and have been covered with a surface of cement. They are erect figures, with their hands extend-

ed, and supporting the folds of drapery with which they have been clothed. Their features have been destroyed, by removing one-half of their heads, or as far as the lips, leaving the hinder halves with the ears, enormously large, appended*.

The work of mutilation was one of some labor, and having been executed with precision, will have been directed by authority, possibly by that of the Arabian conquerors. A subsequent and less systematic mutilation has been practised on the idols, by breaking off their hands, and fracturing their legs, for the merits of which JENGHIZ, TIMU'R, AURANGZE'B, and even TIMU'R SHÁH DU'RÁNNI', who are all accused, may dispute.

The idols stand in vast niches formed in the rock, whose sides on a level with the necks of them have been embellished with paintings. These consist of busts and seated figures, both male and female. The niche of the superior idol has on each side a line of twelve female figures, and, what is of great importance, at its summit, over the idol's head, is an inscription, obviously intended to unravel the mystery. The niche in which stands the second idol in importance has no inscription, but on either side has lines of twelve male and female busts, among which is one so valuable that we need not regret the absence of a literal testimony; over the head of this idol is a painted full length female figure. The niches of the other idols are also embellished with paintings.

On either side of the niches are series of stairs, cut in the rock, which conduct to their summits or to the heads of the idols—each series of steps leads to a small square apartment, and these several apartments have been superbly decorated with gilding and lapis lazuli. To illumine these passages, apertures have been cut through the rock towards the idols. We ascended to the summit of the second idol by the passage on the one side, and walking round the hinder part of its head, descended by the steps on the other side. Near the summit or above the lines of paintings the niches have been widened, and on either side has been formed a *takht* or sofa, obviously for the convenience of sitting upon. The superior idol has or had the same facilities of ascent to the summit, but at the time of our visit the lower caves near it were occupied by an unaccommodating Tajik, who had stowed in the passage his stock of provender. We could not prevail upon him by menace or entreaty to open the path, and he evasively affirmed that he had never heard of one. We did not insist with him, relying upon making a further visit, which until now has not happen-

* See a sketch of them published with Lieut. BURNES' Description, J. A. S. vol. ii. 561.

ed. It is a great point to gain these upper stations, as from them may be profitably inspected the paintings.

Between the legs of the superior idol are entrances conducting into spacious apartments surmounted with domes—and there are many other caves at *Bámián* which display the dome or cupola:—these we imagine to have been particularly temples. They, in common with all other caves, were covered with cement, in which the lines of moulding surrounding their circumferences, with the ornaments at the summits of the domes, have been formed. The interiors of all of them are of a glossy black color, from the smoke of fires which were or have been kept up in them. Many of the caves at *Bámián* are remarkable for their dimensions, and have other peculiarities in their form and embellishments. The most curious are found above the superior idol, but in another cliff rising backward; so that in walking from them to the front or south, we reach the edge of the perpendicular wall of rock in which that sculpture is carved. In these caves we saw the names written with charcoal of W. Moorcroft, W. Trebeck, and G. Guthrie! They are gained by an ascent a little to the left or west of the idol.

There can be little doubt but that of the vast number of caves, which do not terminate in cupolas, many were the residences of the priests connected with temples; others may have been the abodes of ascetics or monastic classes; and as we find in *Afghánistán* that the cave is invariably the companion of the sepulchral tumulus, without reference to its nature, or whether it be a tomb or cenotaph, we may suppose the majority of the excavations at *Bámián* to be of the same character. When circumstances permitted the erection of a tumulus, it became necessary to excavate a cave—and we need not be surprised at the vast number of caves at *Bámián*, when we have under our eyes the ruins of a large and once flourishing city, or when we consider the spot was a sacred one, possibly the most sacred, of the professors of the then existing religion, and whither the dead of the surrounding regions might, from pious motives, be carried for deposit.

The inhabitants, in speaking of the three superior idols, call them the father, mother and son,—presuming the second in consequence to be a female; but there is no distinction in the figure to warrant the supposition that its sex varies from the others. Of whatever sex the whole may be, there is little reason to doubt but they are of one and the same.

We visited *Bámián* under the idea of meeting with Buddhist antiquities, but it became evident that they were of another character. The inscription was in characters unknown to us, and continued so

until we were favored by the alphabets of the *Pehlevi* and *Zend* from Mr. PRINSEP, when we ascertained it to be a form of *Pehlevi*. The bust of the king among the paintings in the niche of the second idol, we had found to bear an exact resemblance to the busts on a series of coins constantly and numerously found at *Beghrám*, and which we called Parthian provisionally; but the characters of the legends on these coins were very different from those of the *Bámián* inscription. At length, however, a coin was found of the same class, with the characters plainly similar—in fact comprising three of those forming the inscription (see Plate XLIV). We now began to suspect we had sufficient evidence to assign the idols of *Bámián*.

Under the idea that the inscription might be rendered NANAIA, we had ventured to communicate our suspicions to Mr. PRINSEP: should they be confirmed, the idol might be supposed to be an image of Diana or the moon, called by the old Persians NANAIA—but we are not yet confident of the reading; and viewing a succession of idols, it occurs to reflection that they may possibly commemorate a series of sovereigns: and this, even if the reading be allowed; for we find over the second idol which has no inscription, a full length female figure, which may be *Nanaia*, and the first idol has no figure, but a name in its place. We must confess, from the general appearance of the idols, we should suppose them to represent male personages.

The coins referred to are probably of that description marked by Colonel TOD, when he enumerates among his collection "rare ones of a Parthian dynasty unknown to history." The term Parthian may cease to be applicable, but we doubt whether the kings commemorated by these coins, and, as we suspect, by the idols of *Bámián*, are unknown to history. We take them to be the *Kiánian* dynasty, whose records, more or less authentic, are to be found in Persian authors; and whose descendants, if their own accounts be credited, still exist in the persons of independent chiefs in *Seistán*. The Tájiks, so numerously dispersed over *Afghánistán* and *Túrkistán*, and no doubt the more ancient inhabitants of the countries, represent the nation, in olden time, obedient to the princes of this dynasty. For a series of ages, in *Afghánistán* at least, the Tájik authority has been superseded; and, within memory, the proprietary rights of the Tájik to the soil have been seriously infringed by the encroachments of the Afgháns. He preserves few traces of his origin or descent, and as a convert to the uncompromising tenets of Islamism, recollects with horror that his country was once governed by infidels—while, as at *Bámián*, he resides, and follows the ordinary occupations of life, in the temples,

from whence his ancestors, in all due solemnity, invoked the glorious sun and dazzling hosts of heaven.

Admitting the evidence upon which we ascribe the idols of *Bámíán* to the princes of the *Kiánián* race, without prejudice to their individual character, or whether they be idols of *Nanaia* and other deities, or statues of sovereigns—we naturally turn to consider the possible epoch of their construction; and this, if not absolutely to be fixed, is brought within a certain and comparatively recent period, or one subsequent to the destruction of the Greek-Bactrian monarchy. This monarchy, as JUSTIN testifies, was overthrown by the Parthians, and the fact is perhaps as easily to be credited as that its subversion was effected by the Getæ; though it must be allowed, that in support of the latter opinion, STRABO is very grave authority, particularly when he enumerates the hordes or nations that effected the subversion, the Asii, Pasiani, Tochari, and Sacarauli. It may be, as SCHEFED hints, that both had a hand in it; but the conclusion by the same learned author that the Getæ remained in possession, may be liable to doubt, if we recognize the *Bámíán* idols to be memorials of the Parthian (qy.) conquerors of *Bactria*. It is proper, however, to note, that about this time, the AZOΣ dynasty, whose coins we have, seems entitled to be considered; and if that appellation have any connection with the name of the first of the four Getic hordes, as, we believe, Mr. PRINSEP suspects, both JUSTIN and STRABO may be reconciled; for, according to every appearance, the *Azos* dynasty originated in the regions bordering on the Indus towards its source. At the same time, it must be remembered, that we suggest the possibility only that the *Bámíán* idols may refer to the Parthian (qy.) conquerors of *Bactria*. We have remarked that the year 56 B. C. has been mentioned as the epoch of the construction of the idols, (that will be of the more ancient one,) and this epoch might coincide with that of the supercession of the Greek-Bactrian monarchy; but when this date is quoted as being found in the *Mahabhárat*, either the authority of that work has been carelessly advanced, or the work itself must considerably abate its pretensions to the antiquity conceded to it by some.

We feel repugnance to renounce old and favorite theories, but they must yield to facts. We had plausibly enough given the Greeks in *Bactria* for successors a race of Getic or Indo-Scythic sovereigns, as we conveniently called them; and we concluded them to be of the Buddhist faith, because we have read that such faith was prevalent in Central Asia about the commencement of the Christian era. Without deeming it necessary to contest the latter fact, in favor of which, indeed, some proof may be adduced, we have gradually, however,

grown sceptical as to that of Buddhist supremacy in these regions; and the term Indo-Scythic has yielded to that of Mithraic, which may safely be adopted, as clearly indicating the religion of the ruling powers, while it affects not the question of their race or descent. It may be observed, that the later antiquities in *Afghánistán* and the *Panjáb*, or in the countries along the course of the Indus, are apparently mixed Mithraic and Buddhist; nor is it improbable that the two systems, if they were really generically distinct ones, should have been blended in the limits to which both extended, and were both met—it being considered that Buddhism will have been propagated with vivacity when Mithraism was languishing in decline.

Our objections to the term Parthian, as applied to the coins provisionally so called, and to the princes commemorated by them, and possibly by the idols, arise principally from the impossibility of deeming them *Arsakian*. Under that powerful dynasty, which so long controlled Persia, it is generally understood that the worship of Mithra was discouraged:—we know not why it should have been, and might ask in return, of what religion besides the Mithraic could the Arsakian monarchs have been professors? It may be, that as Parthians, who have been supposed to be of Scythic origin, they were followers after the manner of their forefathers, whose rites it is one of the objects of the *Zendavesta* to depreciate and to condemn: while with the virulent feelings common to sectarians, and in possession of the necessary power to allow their exhibition, they might have neglected no occasion to discountenance the opposite rites and observances in vogue with the people of Cyrus —whence may be accounted for, during their sway, the neglect of Persepolis and the fire temples of *Istakr*. The fire-altar never occurs on any of the coins of the Arsakian princes, while it is seen on those we suspect to be referrible to the princes commemorated at *Bámián*. The same emblem, indeed, distinguishes the coins of the Sassanian princes of Persia, successors in authority to the Arsakian line, and who rekindled the sacred fires throughout the land, which had been extinct for centuries—but on their coins, it is always accompanied by two guardians or defenders—which are wanting on the coins of our princes; and as the more simple may be presumed the more ancient form, we might deduce from the circumstance a corroborative proof, that they are prior in date to the Sassanian monarchs of Persia. Should this view be correct, we learn that cotemporaneous with a portion of the Arsakian dynasty, a powerful and independent sovereignty existed in *Bactriana*, whose princes became of the orthodox Mithraic faith, or that so lauded in the *Zendavesta*. It is obvious

also that they must have been subsequent to the Greek monarchy—and who they were, and whence they came, can only be profitably speculated upon, when we become acquainted with the antiquities hidden in the regions north of the Indian Caucasus. It is an advantage, however, to possess the knowledge of their existence, their coins and memorials, which display alike their language and religion.

The height of the larger idols has been estimated at 120 feet and 70 feet respectively; the third may be about 50 feet, and the two others were 35 and 25 feet in height. Surveying them, in connection with the theory that they serve to commemorate sovereigns, the gradations in size, as well as their numbers, may be turned to profit; the former denoting the degrees of prosperity under which they were formed, and the latter authorizing us to infer that there were at least as many sovereigns as idols. It is also probable that these idols, with their accompaniments of caves and temples, are not posthumous memorials, but that they were constructed during the lives of the monarchs who projected them. That they are the labors of a series of kings, is an inevitable conclusion, from the moral impossibility that they could have been formed by a single one.

Supposing that *Bámián* was peculiarly a sacred place, and on that account pre-eminently selected for the burial-place of the sovereigns of the age, we may inquire what evidences we have of their sepulchres. Some ancient authority,—we believe Ctesias or Diodorus,—describes the mode of interment of the old kings of Persia—which was by lowering down their remains from the summits of precipices into caves hewn in the rock, and then closing up their entrances. Some of the caves at *Bámián* are so situated, as exactly to come within this description; they are now inaccessible, and from their small apertures could scarcely have been intended for dwellings, while without some such contrivance, as lowering down workmen from the top of the eminence, it is difficult to imagine how they could have been hewn at all. It is proper to observe, that at *Bámián* there are none of the structures now familiarly known to us as topes, and which are so abundant in the regions east and west of the Indus; and their absence might suggest the idea that they were a later mode of distinguishing departed royalty, and originated at the period when the Mithraic and Buddhist practices became mixed. Such a conclusion might be convenient for adjusting that epoch, and to sanction it, the whole mass of Afghán topes might be adduced as proofs, exhibiting the chaitya and the cave: but there is no reason to suppose the chaitya exclusively a Buddhist form, and topes are not irreconcileable with the mode of commemorating Persian monarchs—if the monu-

ment at *Múrghâb*, north of *Persepolis*, be really the cenotaph of CYRUS, it being nothing but a chaitya or dahgopa; and we hesitate to believe it not to be the tomb of CYRUS, having the hints of ARRIAN and ARISTOBULUS, and the interpretation of an inscription (we believe found on some contiguous monument, which renders the subject doubtful) by Professor GROTEFEND. Moreover, if it be, we may inquire, where are the dahgopes of the successors of CYRUS ?

The most ancient of the topes of *Afghánistán*, which have been yet examined, we think may be referred to the close of the first or commencement of the second century of the Christian era. While we suppose that *Bámián* may be the burial-place of a dynasty of kings, we mean not to infer that it was also their capital, rather supposing that it was not—although the comparatively recent *Ghúlgúleh* may, nevertheless, be supposed to have been the representative of a preceding ancient and considerable city. The Paropámisus had been, previous to the conjectured period of the formation of the *Bámián* idols and caves, the seat of a considerable power,—that of the Pandava prince SUBHÁG, whose son GAJ, the founder of *Gajni (Ghuzni)*, lost his kingdom to EUTHYDEMUS and his sons.

It has been usually conjectured that *Bámián* is the *Drapsaca* of ARRIAN, occurring in ALEXANDER's route from *Bactra* or *Bulkh* to *Alexandria ad Caucasum*. *Drapsaca* is called *Drastoca* by PTOLEMY, which WILFORD tells us is a substitute for the Sanscrit *Drashatca*, or " the stone city." Admitting the etymology, we need not credit the accompanying assumption that " towns before were only assemblages of huts"—an assumption founded on the caves of *Bámián* being hewn, as indeed all caves are, in the rock—and thereby forming a stone city. If our preceding deductions be correct, they never, strictly speaking, formed a city at all; although one naturally, and as is proved by its remains, grew up and existed in their neighbourhood. Farther, if our conclusions as to the epoch of the formation of the idols be well founded,they consequently did not exist at the period of ALEXANDER's expedition, which may account for no hints being given of them by the classical historians and geographers of the West. We are not certain therefore that *Drapsaca* was *Bámián*, or that a city existed there at all, admitting the probability that a valley so conveniently situated and fertile, was even at that time adequately peopled. The stone city was a term applicable to any substantial one. TIMUR in his march from *Bulkh* to India halted for some days, as SHERIF-U-DIN says, at the " fine city" of *Khúlm*. This is an ancient site, and with *Hybuk*, *Kunduz*, and any other locality in the route, may have a claim to be considered *Drapsaca*. *Bámián* has also been suggested to represent

Alexandria ad Paropámisum. The last word appears to be a careless introduction of the geographers for *Caucasum.* We believe it was not used by the original historians—excusable however, when we consider that the ancients deemed the Paropámisus a continuation of Caucasus, and the passes of the hills between *Cábul* and *Bámián,* are to this day spoken of by the natives as passes of the *Hindu Kosh,* which, strictly speaking, they are not. *Alexandria,* it is clear, was built at the southern base of *Caucasus,* indications of its locality more fully answered by *Ghorbund* and *Beghrám. Bámián* may be termed south—but widely—of the true *Hindu Kosh,* and, we should think, has little pretension to be considered *Alexandria ad Caucasum,* beyond the doubtful one conferred by vicinity.

Examining the pretensions of *Bámián* to be considered in another point of view, as a sacred locality, implied perhaps by its being selected as the burial place of kings, we have Wilford's authority, that it is represented in the books of the Buddhists as the source of holiness and purity. This may be of some value, as shewing that the same spot was held in the same venerated light by the followers of two religions generally understood to be very opposite; and as the antiquities are certainly Mithraic, we might draw the conclusion, that the Buddhists have appropriated the property of others, and that the books referring to *Bámián* are comparatively modern—or we may suspect that Budhism was originally merely a modification of Mithraism. We judge it unnecessary to detail the Mahommedan traditions respecting *Bámián,* which ascribe, however, the idols to Sa'lsa'l, whom they generally assert to have been a giant infidel, first vanquished and then converted by Azaret Ali; nor need the Buddhist and Brahmanical traditions be noted, with a view to comment, which consider Sharma or the patriarch Shem to be the founder of *Bámián,*—because we have no proof that he was, or was not;—but when a writer so talented as Wilford asserts with apparent gravity, that *Bámián* is the Mosaical Eden, it may be useful to review the grounds on which he bases his opinion and makes an assertion so singular. He is compelled to recognize in the *Landhi Sind Helmend,* the rivers of *Kundus* and *Balkh,* the *Phison, Gihon, Frat* and *Hiddekel* of the Mosaic accounts—but it is plain that he depends upon the statements of the Puránas and Zendavesta. The former contain so many evidences of modern composition, that they surely ought not to be brought into competition or comparison with records of high antiquity, as are acknowledged to be those of the Pentateuch. The age of the Zendavesta has been much disputed, some conceiving it of unfathomable antiquity; others, among whom is our countryman Hyde, ascribing it to the epoch of Darius

Hystaspes; while others have deemed it of comparatively modern origin. We are free to confess that we espouse the latter opinion, and the very passages cited in favor of its remote age, we think, are decisive against it. We advert to this subject the more willingly, because we cannot help suspecting the possibility, that the *Zendavesta* was compiled in the court of the sovereigns commemorated at *Bámián*.

It is worthy of note, that the Brahmans, Buddhists and Mithraists have the same ideas as to the locality of paradise, shewing that they must have acquired them from each other, or from some common source. It is not improbable that the two first adopted them from the last, and it may be conjectured, though it will tell little for the antiquity of the *Zendavesta*, that *Bámián* may have been clothed with a sacred character, from the very circumstance of its having been made a burial-place of kings—for so the *Zendavesta* itself commemorates, when it describes *Gorotman (Bámián* or its vicinity) as a terrestrial paradise, and reveals its nature when it figuratively and significantly adds, "the abode of the Supreme Being and the *Blessed.*" There can be no doubt but that the larger idol of *Bámián* is also the more ancient, and with its accompanying caves became the nucleus, around which all the other caves and idols were subsequently and successively formed; and it is a fair inference that, prior to the construction of the first idol, there was no burial place of kings at *Bámián*, and none worthy of emphatic panegyrism by the author of the *Zendavesta*.

The remote antiquity conferred by some antiquarians upon the *Zendavesta* is not claimed by its author; and why he should be called Zoroaster who called himself Zerdesht, is only to be accounted for by the desire of theorists to identify him with a celebrated person of that name, who existed, according to authentic history, some centuries before him. Zerdesht so clearly narrates the details of his career, that it is impossible to misunderstand them, and they cannot be more correctly or more concisely represented than in the elegant language of Professor Heeren, one of the most able advocates of the impenetrable antiquity of the *Zendavesta*. The Professor writes—"The works of Zoroaster (Zerdesht) abound in details relating to his own person, as well as the countries and kingdom, which were the first scene of his career as a reformer. He proves by the clearest geographical data, that his native country was Northern Media, Azerbijan, or the territory between the river Kur or Cyrus and the Araxes, both of which empty themselves into the Caspian. Here he first appeared as a legislator and a reformer; but soon quitting this district, he passed into the countries east of the Caspian into *Bactra*, the residence

of king Gustasp, who became his disciple and admirer. The original seat therefore of his new religion or doctrine was *Bactra*, whence (under the protection of Gustasp) it was disseminated over *Iran*."

Zerdesht, in giving the name of the sovereign of *Bactra*, his patron, possibly gives that of one of the sovereigns commemorated at *Bámián*. If it be so, we may associate with him Lohrasp his predecessor, and it is deserving of particular notice that the romantic history of Persia ascribes to Lohrasp the construction of a hermitage, to which he retired, abdicating his throne in favor of Gustasp, and from which he was called forth to repel an invasion upon *Bulkh*, (Gustasp being absent at the time in *Seistan*,) when he fell in battle. We perhaps gain from this history a hint as to the origin of the caves and idols of *Bámián*. Having coins with legends, which it is not too much to hope may be interpreted, we may ultimately ascertain these facts, when we shall be afforded triumphant evidence of the age of the *Zendavesta*; and it is cheering to reflect that records are preserved of these kings independent of the *Zendavesta*, itself a most important and valuable one. These records are within our reach, and we have only to distinguish fiction from reality, and history from romance, to acquire a full and satisfactory knowledge of a hitherto dark period.

Zerdesht has accurately described the extent and partitions of the kingdom in which he lived, as justly observed by Professor Heeren, and what he describes we shall allow the Professor also to state for us. "The opening of his *Vendidad* contains a catalogue of the provinces and principal cities of that kingdom; and this record, so invaluable to the historian, is so clear and complete as to leave no room for doubt. The chief provinces and places, sixteen in number, are registered according to their oriental appellations, and for the most part are easily to be recognized. We learn hence that, except *Azerbijan*, to the west of the Caspian, all the countries east of the same, as far as northern Hindustan, were, together with the latter country, subject to king Gustasp, at whose court the sage resided. The whole of *Khorásán* is here enumerated, with the several provinces of which it is composed—*Bactriana* and *Sogdiana*, *Aria* or *Sehestan*, *Cabul*, *Arokhage*, the confines of Hindustan, and finally *Lahore* in the *Panjáb*, are all successively mentioned."

The record of Zerdesht is indeed historically valuable, and describes the extended empire of *Bactria* as it probably existed under Eucratides, and as it may possibly have fallen into the hands of the Kiánians—in many of the countries as we know, and very probably in all of them, are found their coins and memorials. It will be re-

membered that *Ariana* or *Khorásán*, formed a portion of the *Bactrian* empire, as recorded by Strabo. Professor Heeren remarks—"Nothing, however, is said of the two chief provinces of the Persian empire, *Persis* and *Susiana*, nor of their capitals, *Persepolis* and *Susa*, nor of *Babylon*, which, nevertheless, were the customary residences of the kings of Persia, and in particular of Darius Hystaspis." So remarkable an omission will cease to surprise, when probably at the epoch of Zerdesht, we may suspect those provinces, and also *Babylon*, were under the rule of the Arsakian princes—and therefore could not be enumerated by him as forming part of the kingdom of Gustasp. They were also under the spiritual influence of those false Magi, in the estimation of Zerdesht, against whom he is so severe, and whom he stigmatizes a *káfraster*—a term for infidel preserved by Muhammedans of this-day in *kafr*. The possible fact of a powerful independent monarchy in *Bactria* subsequent to the Greek one, gives rise to many singular reflections on the probable relative position it occupied with respect to the Arsakian: and we may divine other reasons besides those already known, which induced some of the latter Arsakian princes to fix their capital at *Babylon*, or rather *Ctesiphon*. We feel, however, that the time has not arrived for delicate speculations, neither can we venture to fix with certainty the epoch of the Kaiánian monarch, but we do feel confident that materials exist to fix it,—and we do cherish the hope that it is possible to destroy that flagrant monster of fiction and prodigy of national vanity, Persian history. If the Lohrasps and Gustasps prove to be Bactrian monarchs, as indeed Zerdesht tells us they are, we may ask whether Queen Homai may not be Semiramis, and Rustam may turn out to have flourished a little before the age of Muhammed. The same sources of information are open to us, as were to Shah Ismael when he wrote to Sheibani Khán, "That if the right of succession to a throne was decided by hereditary descent only, it was to him incomprehensible how the empire had descended through the various dynasties of Peshdadians, Kaiánians and the family of Chengis to himself Sheibani."

As for the *Zendavesta*, however, it may be admitted that a Zerdesht flourished in the reign of Gustasp. It is by no means certain that that work as now preserved was written by him; on the contrary, the dialect in which it is written, would seem to be proof that it was not—for it must assuredly be the most recent of all the dialects of the Pehlevi—if Pehlevi at all; and accordingly on reference to coins, we discover the first traces of it on the very last of that series, (whether Sassanian or Peshdadian) which bears them, and then not in the legends of the coins, but as marks manifestly punched on them after they had been in circulation!

We submit these notes on the idols of *Bámián*, with the observations occasioned by them, in all due humility—and furnish the authorities in the inscription, figures, and coins, on which we have based our conjectures, that others may judge how far they may be correct; and it must be noted that the coins which bear legends in the characters of the *Bámián* inscription, do appear to us at least to be the most recent of the class to which they belong. This we consider rather fortunate than otherwise; for if they are still Kaiánian or Peshdadian, we may be able to find other caves and hermitages for Lohrasp and Gustasp—it being remembered that we are yet standing only on the threshold of discovery.

Kabul, June, 1836.

IV.—*New types of Bactrian and Indo-Scythic Coins, engraved as Plate XLIX.* By James Prinsep, *Sec. &c.*

I did not expect to be again so soon summoned to resume the graver in the department of Bactrian medals; but to do so when such novel and interesting specimens are handed to me, is no less an obligation than a pleasure.

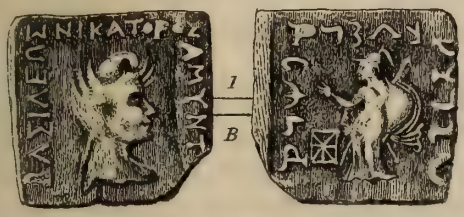
The two main attractions of my present plate are represented with scrupulous regard to fidelity, from the coins themselves, which were entrusted to me for the purpose by their fortunate possessors, as soon as they were discovered.

No. 1 is an unique of *Amyntas*, a name entirely new to *Bactria*; it is a square coin of bronze lately procured by Colonel Stacy from the *Panjáb*, in excellent preservation.

Obverse. Bust of the prince wearing a curious cap, which may possibly represent the head of an elephant, but from the worn surface cannot exactly be made out—legend on three sides of the square, ΒΑΣΙΛΕΩΣ ΝΙΚΑΤΟΡΟΣ ΑΜΥΝΤ (*ου*).

Reverse. A standing figure of Minerva, with helmet, shield and spear—her right hand extended in token of peace. Square monogram ⊠. Legend in Bactro-Pehlevi 𐭬𐭫𐭥𐭠𐭪𐭠𐭧𐭪𐭠𐭩𐭪𐭠𐭥𐭠𐭬; quasi, *malakáo ájalade amído*. It will be at once perceived that the native epithet corresponding to *νικατορου* is the same as that for *νικηφορου* on the coin of Archelius published in my September number, (page 548,) and before on the coins of Antialkides and Antimachus, with exception only of the first letter. The word was there read 𐭩𐭪𐭠𐭥𐭠; the initial 𐭩 *a* being substituted for 𐭠, or broad *á* of the *Archelius* and *Amyntas* coins. The third letter in those cases is also rather an 𐭪

Bactrian Coins.







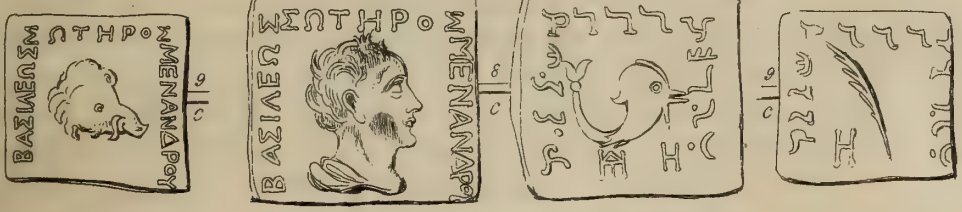












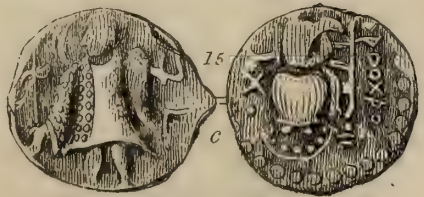








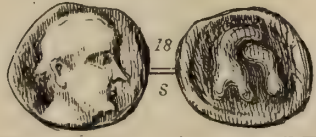




Kodos







l, than ⅄, of which the value is as yet unknown. I have called it *l* ad interim.

Fig. 2 is, if possible, a more valuable acquisition than the above, being the first queen of *Bactria* yet discovered. Dr. Swiney obtained the coin among Kerámat Ali's collection. It was thickly coated with the rust of ages, and, from the helmeted head on the obverse, was looked upon as a Menander, until the Doctor set about cleaning it carefully with a hard brush, and, perceiving a variation of the legend, shewed it to Captain Cunningham, who immediately recognized with a feeling of intense curiosity the undoubted title of a female sovereign ΒΑΣΙΛΙΣΣΑΣ ΘΕΟΤΡΟΠ (ης) ΑΓΑΘΟΚΛΕΙΑΣ—"of the queen Agathoclea, the god-nourisher." This very curious epithet θεοτροπη, a word not to be found in the lexicon, must have been coined on purpose for the queen-mother, after the oriental style of flattery, in allusion to her royal offspring.

Reverse. Hercules seated on a rock (or a *morha*), resting his club on his right knee—monogram ⅄. The Pehlevi legend is most unfortunately so indistinct in one or two places, as to preclude the possibility of our making out the true reading. The first word seems to differ in no way from the ordinary טלרצק *malakáo*, king: and the second would appear to be רדרק *radako*, σωτηρος; then follow two short words שרק ⅄רק which I am totally at a loss to expound, though the individual letters are clear enough.

To these two uniques I have subjoined some new types of Euthydemus, Menander, and Eucratides, which have not yet been engraved, though some have appeared in the lithographs of Masson's drawings.

Fig. 3. A silver tetradrachm of Euthydemus, now in Dr. Swiney's cabinet, having a standing Hercules on the reverse, in lieu of the seated figure. The coin must have been originally very beautiful, but we learn from the memorandum of Kerámat Ali, who purchased it at *Cabul*, that it was taken to Dr. Gerard, who deemed it spurious or not silver*; this induced the vender to put it in the fire (cased in clay) to ascertain the fact, and the smoothness of surface, and clearness of outline were thus destroyed. The *beaux restes* are still sufficient to excite admiration.

Fig. 4 is from Masson's drawing of a small copper piece of Euthydemus. The reverse has a naked horse prancing. Legend as usual, ΒΑΣΙΛΕΩΣ ΕΥΘΥΔΗΜΟΥ. Masson has another similar, but larger.

* Probably it was covered with a coat of muriate, like my Euthydemus.

Fig. 5. A square copper coin of MENANDER, procured by Dr. SWINEY at *Agra;* in good preservation.

Obverse, the usual helmeted head with the legend ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΜΕΝΑΝΔΡΟΥ.

Reverse, the circular shield of Minerva with Medusa's head: the features of the face only worn smooth: legend in Pehlevi 𐭬𐭩𐭮𐭥 𐭮𐭥𐭫𐭰𐭪 𐭫𐭫𐭫𐭪.

Fig. 6, from MASSON. The *reverse* here presents the bird of Minerva, so common on the Athenian coins; in all other respects the coin is similar to the last.

Fig. 7. *Obverse* of a smaller copper coin from MASSON. In the centre is a wheel with eight spokes, distinctly so delineated, otherwise we might have supposed it the shield with Medusa's head; the Greek legend surrounds it. The reverse is the same as that of fig. 9.

Fig. 8. In this larger square copper coin Mr. MASSON gives, as a new reverse, a dolphin; but from the appearance of the sketch it is possible that the original may have been an elephant's head—a common device on MENANDER's coins.

Fig. 9. On this the sovereign's portrait is replaced by a boar's head according to Mr. MASSON's sketch, and on the reverse is a simple feather or palm branch: monogram H—legends Greek and Pehlevi as usual.

Figs. 10 and 11. Two specimens from MASSON's collections, one silver, one copper, to shew that the coins of EUCRATIDES sometimes bore the emblem peculiar to ANTIALKIDES*, two conical beehives and two feathers or palm branches.

Fig. 12. An addition to our Indo-Scythic group of the elephant rider, or Kenranos. Col. STACY has just obtained four from the *Panjáb;* all evidently from the same die, but not one containing the legend complete. To save space I have filled it up from the united specimens, and there can be no doubt of a single letter, barbarous as the context appears. *Obverse.* Rája astride on a small elephant, legend (commencing from the right of the head) ΟΙΑΗΩΗ ΟΙΑΡΟΙΑΗΙΑΗΡΟΑΙΩΗ, of which nothing can be imagined but a barbarous attempt at ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΣΩΤΗΡΟΣ, the syllables ΙΑ, ΩΣ, or ΩΝ, and ΡΟ being the only happy conjunctions seized by the ignorant die-cutter.

On the *reverse* the standing figure of ΑΘΡΟ is depicted, with the common monogram, but the legend differs; being ΑΟΗ, or inverted

* This name has hitherto been always written (on MASSON's authority) ANTILAKIDES. M. JACQUET corrected it from the VENTURA coins, and on re-examination of the silver coin in Dr. SWINEY's possession, his reading is corroborated. It also corresponds better with the Pehlevi which is 𐭠𐭭𐭲𐭩𐭫𐭪𐭪 quasi, *atí-alikudo.*

HOV. The same is met with on one of the couch-lounger coins extracted from the Manikyála tope, (see fig. 29, Pl. xxii. Vol. III.) It may possibly be a perversion of the tri-literal MAO. But the horns of the moon do not appear on the shoulders.

Fig. 13. A rare and valuable variety of the Kenranos coin in Dr. SWINEY's cabinet, of which Captain CUNNINGHAM has a less perfect duplicate ; the obverse legend, hardly legible, must be PAO NANO PAO, &c. The reverse has the standing female figure with the horn of plenty, and legend APΔOXPO, as on the gold coins of the same device.

Fig. 14 should have been introduced in my last plate, among what I have supposed the fourth series of APΔOKPO imitations. This coin, of which Dr. SWINEY possesses several equally legible, has the legend APΔOXPO quite distinct, proving that this group must be regarded, not as an imitation but as the direct descendant of the Mithraic series in the Kanerkan line. The appearance of Nágari on one of my coins must be regarded therefore as Greek. It is curious that MASSON should not have detected a single letter on all the specimens he amassed. Some faint remains of them are traceable on those from Behat.

Fig. 15 is a duplicate of MASSON's coin, fig. 15, of my last Bactrian plate, in Dr. SWINEY's possession. A few of the Pehlevi characters are better made out, but the proprietor of this coin still eludes us.

Figs. 16, 17, 18. I terminate this plate with three coins of Kôdes in Capt. CUNNINGHAM's cabinet purchased from the late General ARNOLD's collection, of an entirely new reverse. They are all of silver, deeply indented to throw the head out. The letters KωΔ.. are visible on the smallest of the three, which is otherwise of the best execution. The horse's head of the *reverse* gradually deteriorates until it can be no longer recognized (as in 18) without the earlier coins as objects of comparison. On cleaning one of my Kôdes coins, it was found likewise to have the horse's head reverse; and the horse has been since traced to the *Chouka Dooka*, or degraded Saurashtra series, in some specimens also purchased from the estate of the late General ARNOLD.

Postscript. I cannot delay one moment announcing a very successful reading by Professor LASSEN of Bonn, of the native legend on the coin of AGATHOCLES depicted in Vol. III. Pl. ix. fig. 17, by MASSON, and again engraved last month as fig. 9 of Pl. XXXV. The following is an extract from the Professor's letter this moment received. "The legend on the coin of AGATHOCLES, is in my opinion, in another character, and I think we may recognize in ꤲ꤁ꤢꤕꤟ꤉꤃

the letters अगथुक्लराज, *Agathukla rája,* reading from the left to the right. The first two letters are self-evident—the third is similar enough to the Tibetan and Páli forms of *th* with *u* below: the fourth letter expresses *kl* quite in the Indian manner. If I am right in this, it will be necessary to give to AGATHOCLES a very different position from that assigned to him by Mr. RAOUL ROCHETTE."

The principal objection to this highly plausible solution of the Agathoclean legend is, that nearly the same characters also appear on the coins of PANTALEON. There are differences to be sure, and it might be possible to assimilate the word to the Greek, on the supposition of the first syllable being wanting—thus  will form . . *talava* or . . *talao*... the next letter on MASSON's coin is a ϵ, *j*, and on Dr. SWINEY's a *t* or *n*, but on both coins there are three letters to the left of the female which still remain an enigma.

I have also just had the opportunity of perusing M. JACQUET's first paper on the VENTURA coins, but as this merely enumerates their Greek legends, postponing the consideration of the Bactro-Pehlevi, there is nothing in alteration or correction of my own list excepting the termination of some of the names, *Kodes, Lysias, Vonones* (?) for *Nonus, Azes,* &c. M. JACQUET had remarked the connection of the Hindu coins with their Indo-Scythic prototype when examining Col. TOD's collection, but had not published his sentiments.

V.—*Facsimiles of various Ancient Inscriptions, lithographed. By* JAMES PRINSEP, *Sec. &c.*

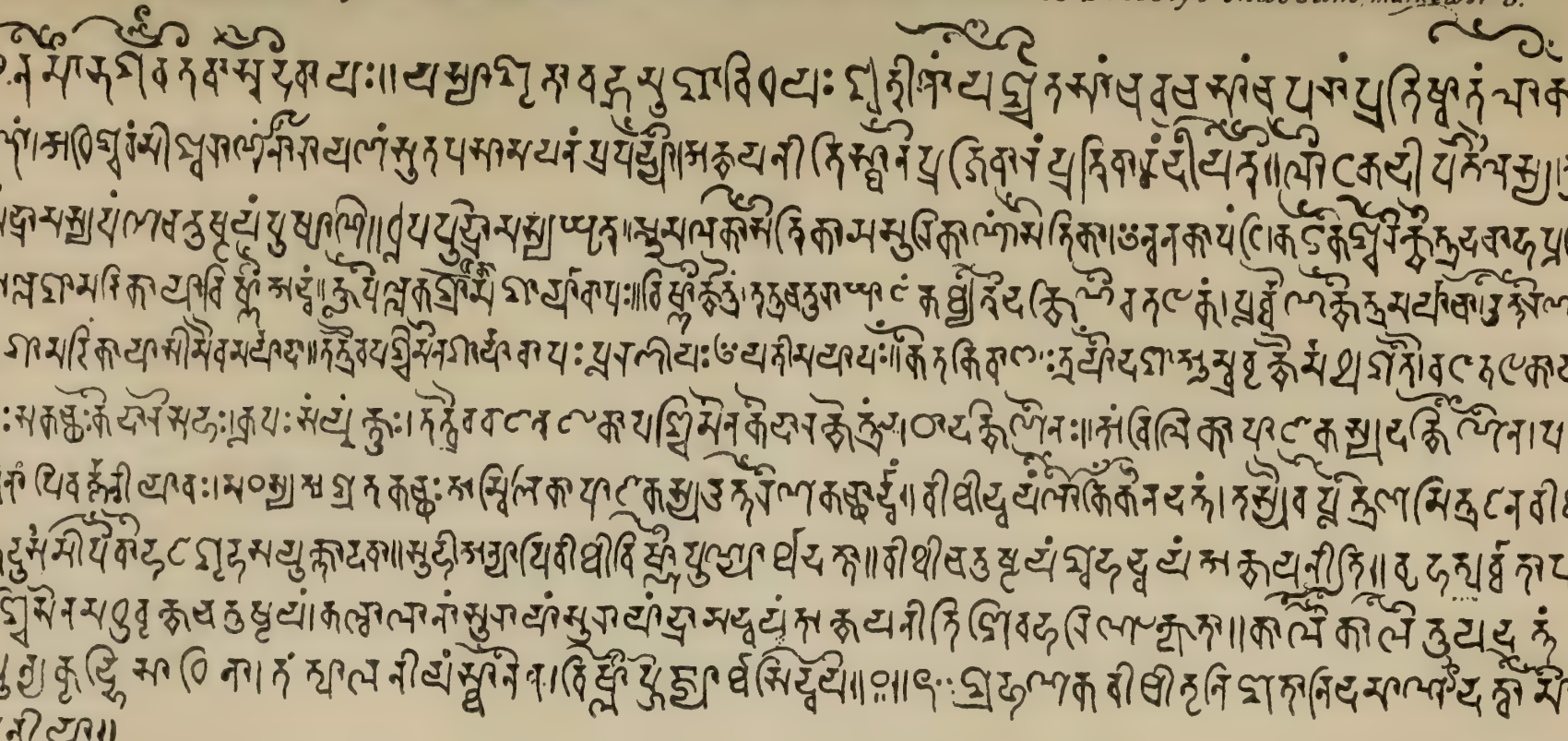
[Continued from page 661.]

Stone Slabs in the Society's Museum.

Many of the inscriptions in our Museum bear no record, either of the places whence they come, or of their respective donors. Unless therefore they contain in themselves such information as may supply a clue to their origin, the greater part of their value is lost. Publication may in some cases lead to their recognition, and this is one of my motives for including them in my present series of lithographs; a stronger motive is, the example they furnish of the variation of Devanágari character prevalent at different epochs; which it is desirable to place in an accessible position for reference, before we can undertake a comprehensive review of the palæography of India.

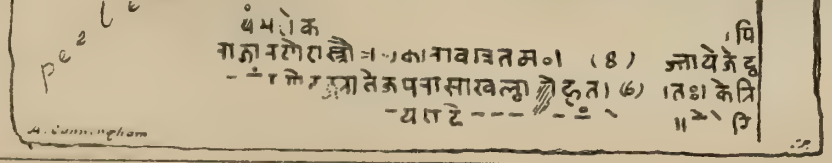
The inscription, marked No. 5, in the Museum (Pl. XXXIII.) is neatly cut on a stone, about $2\frac{1}{2}$ feet long by $1\frac{1}{2}$ feet broad. It is nearly in the same character as that of the *Shekawatí* inscription, pub-

Facsimile of an Inscription on a stone in the Asiatic Society's Museum marked N°5.

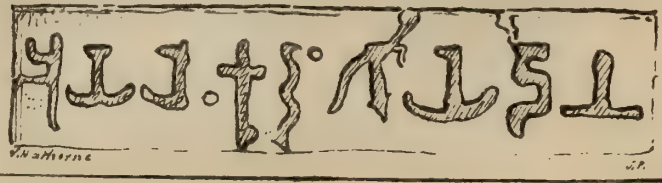


J.Prinsep lith.

Facsimile of a Mutilated Inscription from Chunar.



Old Inscription from Buddha Gaya.



lished in my last volume. There are, however, some peculiar forms, as the *kh*, the *gh*, the *a*, &c. Hardly any of the letters in the whole inscription can be regarded as uncertain; I have had therefore, no difficulty whatever in preparing the following transcript in modern Devanágarí. But as to the interpretation, after receiving a formal certificate from the pandits of the College that, with exception of the verses at the commencement and conclusion, the body of the inscription was not Sanscrit, or was so ungrammatical as to be quite unintelligible, it may be conceived that I was somewhat staggered! However, on conning it over word by word, with a pandit better versed in the out-of-the-way terms employed, the general drift was readily made out, although the connection in many parts still remained broken, and the sense doubtful. As there is neither date nor allusion to any reigning monarch, the fragment is of no historical value; but it may be a curious study for the Sanscrit scholar.

Transcript in modern Devanágarí character.

१ नमो भगवते वासुदेवाय॥ यस्याग्रु*ता बङ्गमुखा विधयः श्रुतीनां यस्येतसांच वचसांच परा प्रतिष्ठा। तं लोककारणमधीश्वरमीश्वराणां नारायणं सुतपसाम यनं प्रपद्ये॥ अक्षयनीतिस्थाने प्रतिवारं प्रतिवारं दीयते लोके दीपतैलस्य। कुंकु मद्रामस्य पणचतुष्टयं पुष्पाणि॥ धूपपूद्रोमस्य घृतं॥ आमलकानां सेतिका मसुरिकाणां सेतिका। उच्चनकापटिकेकै स्वरे चेचं वराहप्रटिका अल्लगामरिकाया विष्णोश्चेचं॥ उपेल्लकग्रामगार्यावापः। विष्णोःचेचं। तच चतुराघाटं कथ्यते दक्षिणेन वटकं पूर्व्वेण चेचमर्य्यादा उत्तरेणापि अल्लगामरिकायाः सीमैव मर्य्यादा। तचैव पश्चिमन गार्यावापः पूरणीयः उयतीमर्य्यादः केतकिवाटः चयोदशआसद्दचैर्मध्यगतो वटतटकादयतःसकच्छः केदारेसदः। कूपःसंयुक्तः तचैव वटतटका पश्चिमेन केदारचेचं दुढ दक्षिणेन॥ अंबिलिकापाटकस्य दक्षिणेन पश्चिमेनापि वर्षनीयावः मढस्य अयतकच्छः अम्बिलिकापाटकस्य उत्तरेण कच्छार्द्ध॥ वीथीद्वयं लौकिकेन दत्तं तस्ये व पुत्रेण मिवटेन वीथी कन्दुसमीपे वोहटगृहसंयुक्ता दत्ता॥ सुहोचन्यापि वीथी विष्णो पुण्यार्थं दत्ता। वीथीचतुष्टयं गृहद्वयं अक्षयनीति॥ दृहत्पर्व्वताः पश्चिमेन मधुष्टचचतुष्टयं कल्वालानां सुरायां सुरायां द्रामद्वयं अक्षयनीति शिवहरिणा दत्ता॥ काले कालेतु यद्दत्तं पुण्यबुद्धिः समाधिना। तत् पालनीयं स्थानेन विष्णोः पुण्यार्थ सिद्धये॥ यहणकवीथी चीनि शतानि द्रमाणेदत्वा क्रीननीया॥

Translation.

Salutation to the divine son of Vasu Deva, (Krishna.) We adore with becoming reverence Náráyana, lord of lords, creator of the three worlds, source of the holy precepts of the vèdas, whose praise is beyond speech and thought.—For the abode of the eternal† day by day the pious offer up lamps of oil; of saffron‡ and asafœtida four

* This should be त्रि. † A Vaishnaví temple so called?

‡ *Kunkuma-dráma;* the whole of this passage is very obscure, and full of orthographical errors.

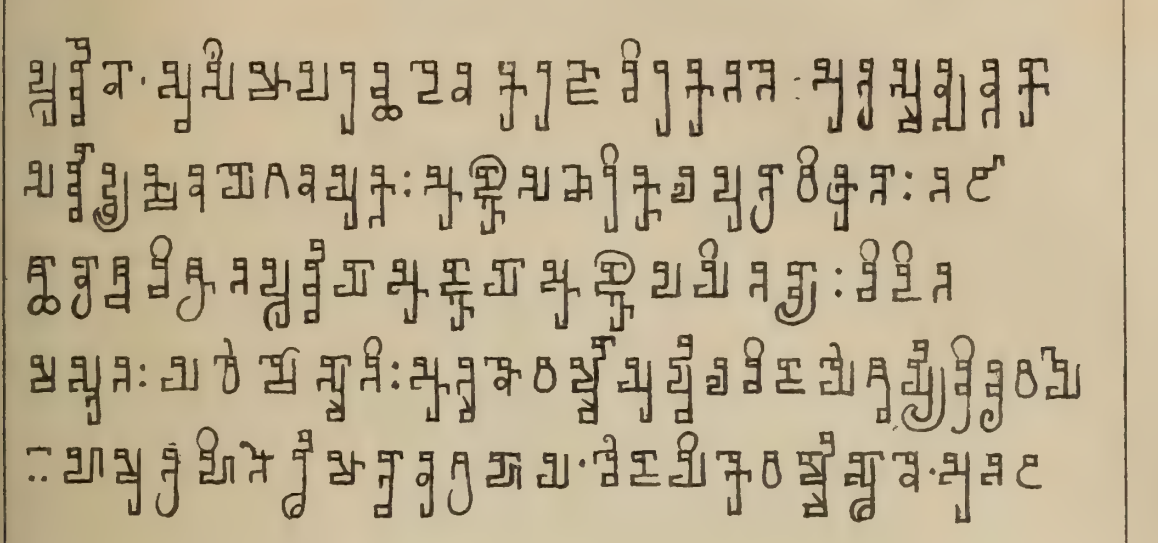
pans :* of incense, *dron* flowers, ghee, *amalika* (myrobalan fruit) a *sèr* weight; *masuri* pulse, a sèr; of dry-wood perfume *(indan)*; *davaha* (?) 16 pans.—(Here follows apparently an enumeration of landed property belonging to the temple or *Vishnu-khètram*)—*Allagamarika* (?) a road,—*Upa allaka*, a small village, with a good tank having four pucka ghâts. They say on the south is a *baṛ* tree; on the east a boundary wall; on the north the wall of UPALLIKA village; on the west a bazar and old tank, where is also a wall. Between the *baṛ* and a great many mango trees are 13 *ketaki*† trees. Also hard by, a well with a cattle-trough attached. On two sides of the *baṛ* tree a chabutra is built, on the west a boundary wall: farther off to the south, a tamarind tree, on the south and west are two roads, and a police *chaukí*‡ *:* further on a drinking trough. On the north of the tamarind tree, half a trough; item two rows (shops) built by LOKIKA; whose son, named MITRATA, built a row, a cistern, and a handsome dharmsála. Another lane also, two houses and four bazars, for the *Vishnu-khetra*, bounded to the west by several large hills,—four *mauwa* trees, two pottery and distiller's shops (?) were severally given by SIVA HARI, another son. (Verse.) Whatever has been thus presented to Vishnu, may they for ever hold sacred; and let nobody abstract the house, the bazars, (300 ?) nor the numerous trees.

Seoní grant, Plate XXIII. et seq.

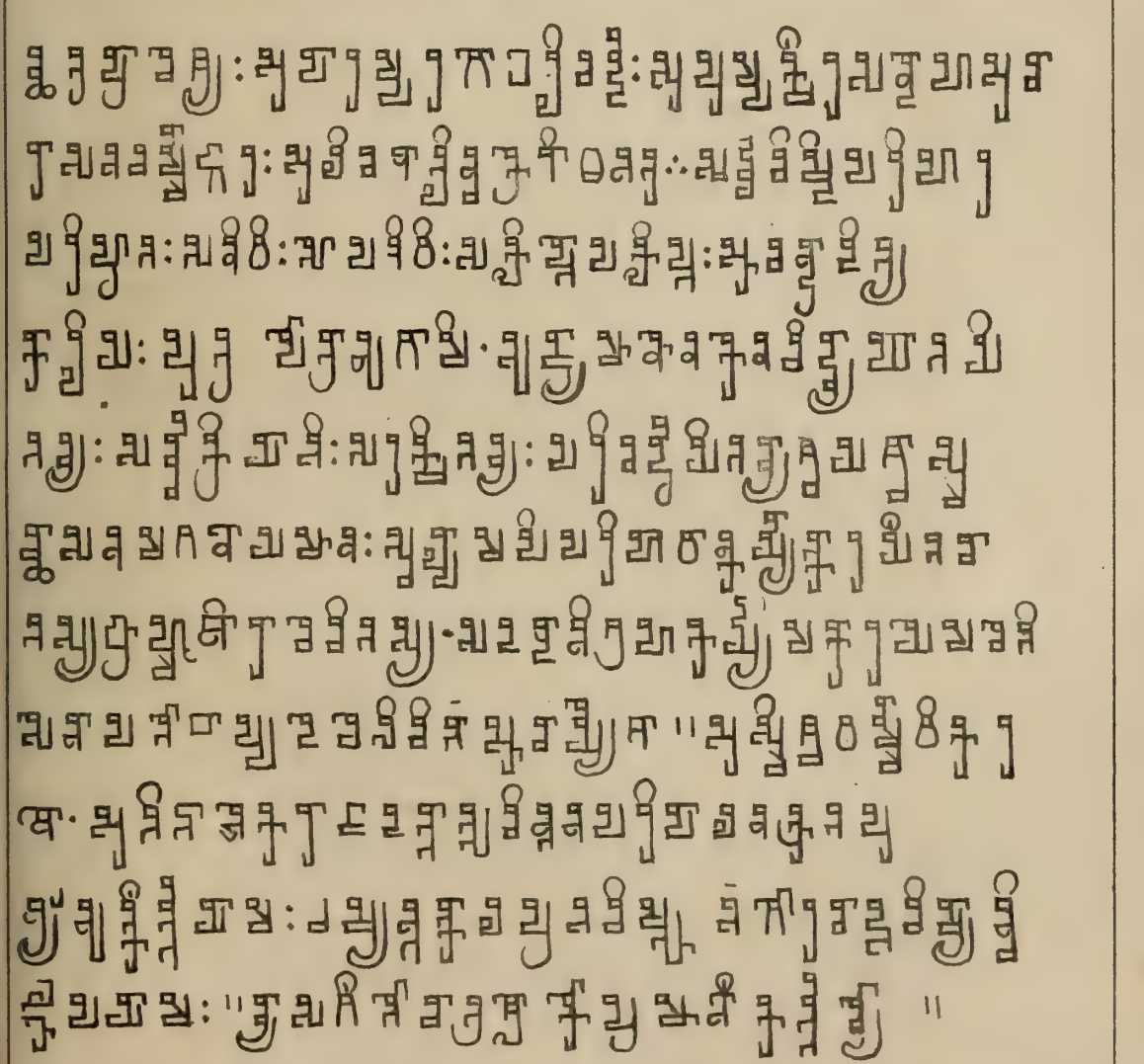
For this ancient document I am indebted to Mr. D. M. MCLEOD, assistant to the Commissioner of the *Nerbudda* territories, who stated, on sending me a copy of the first plate, some months ago, that it was one of five in the possession of a native zemindar in the *Seoní* district, supposed to be a *jatas* or *sanad* confirming lands granted by former *Goand* chiefs, but wholly illegible to the pandits of the *Nerbudda* district. Recognizing the character as identical with that of the *Chattisgarh* inscriptions, published by Mr. WILSON in the Asiatic Researches, vol. XV. page 507, I supplied Mr. MCLEOD with this alphabet and with a transcript of the plate in modern Nágarí, of which the sense, however, could not be wholly made out for want of the context. Through absence of leisure, and illness of his pandit, the discoverer has been obliged to relinquish his laudable desire to decypher the document on the spot, (where he might, doubtless, have been aided by the names of the countries and villages mentioned in the grant,) and to entrust a faithful copy of the remainder, made with great care by his young native friend MIR JÁFIR ALI, (who has performed his task remarkably well,) to our more hazardous attempts in Calcutta.

* 8 Tolas. † Pandanus odoratissimus. ‡ *Bhath.*

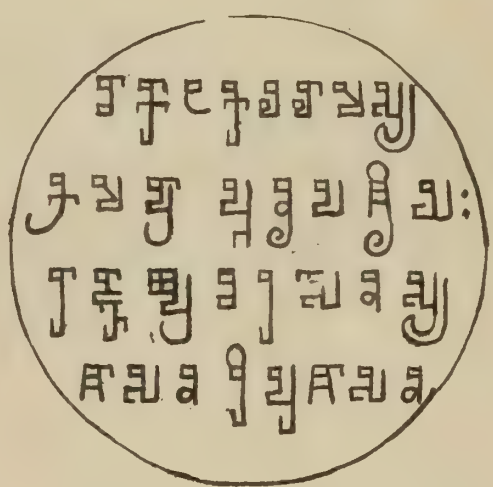
Third Plate continued



Fourth Plate



Fifth Plate.



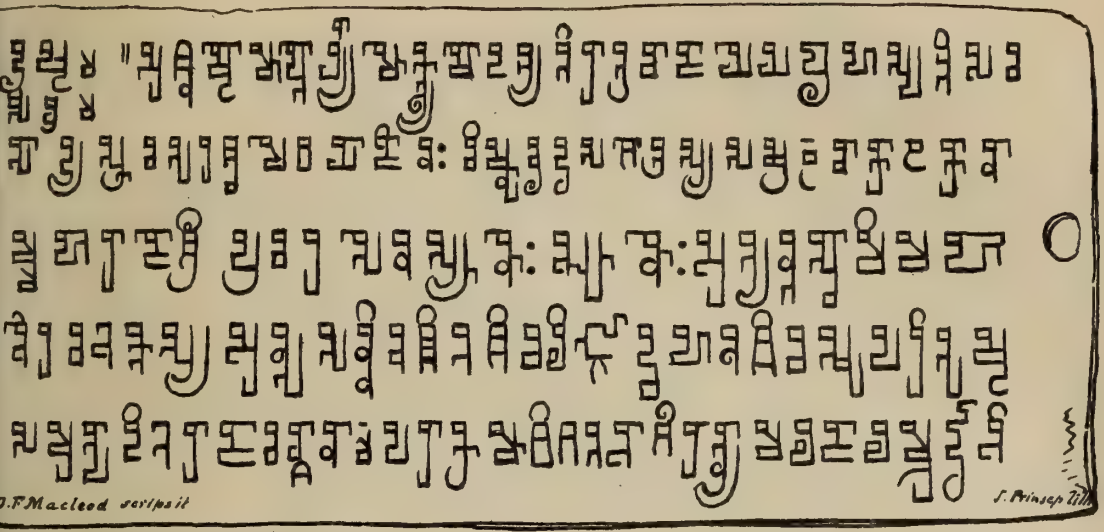
Inscription on the Seal.

Letters peculiar in form.

J. Prinsep lith.

Printed at the Oriental Lith^c Press. Calcutta

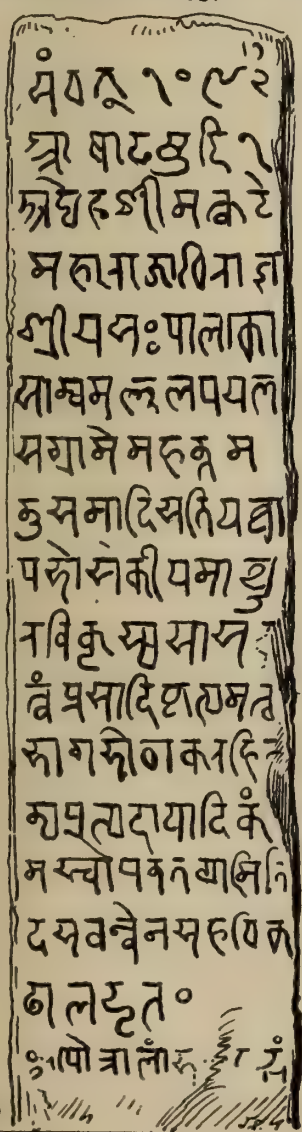
One of 5 Copper Plates in posseſsion of a zemindar at Seoní.



D. F. Macleod scripsit

J. Prinsep lith.

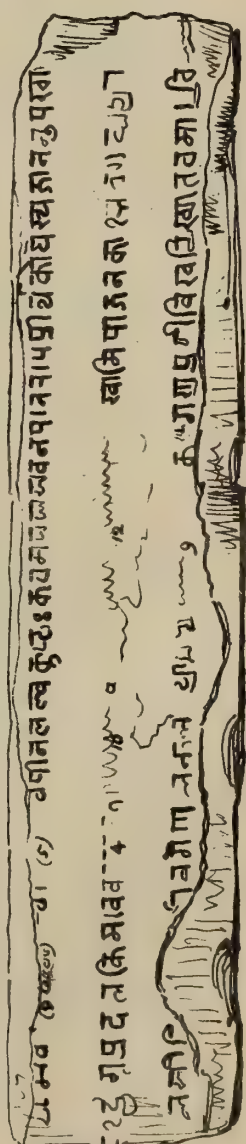
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Chattisgarh Alphabet, compared.

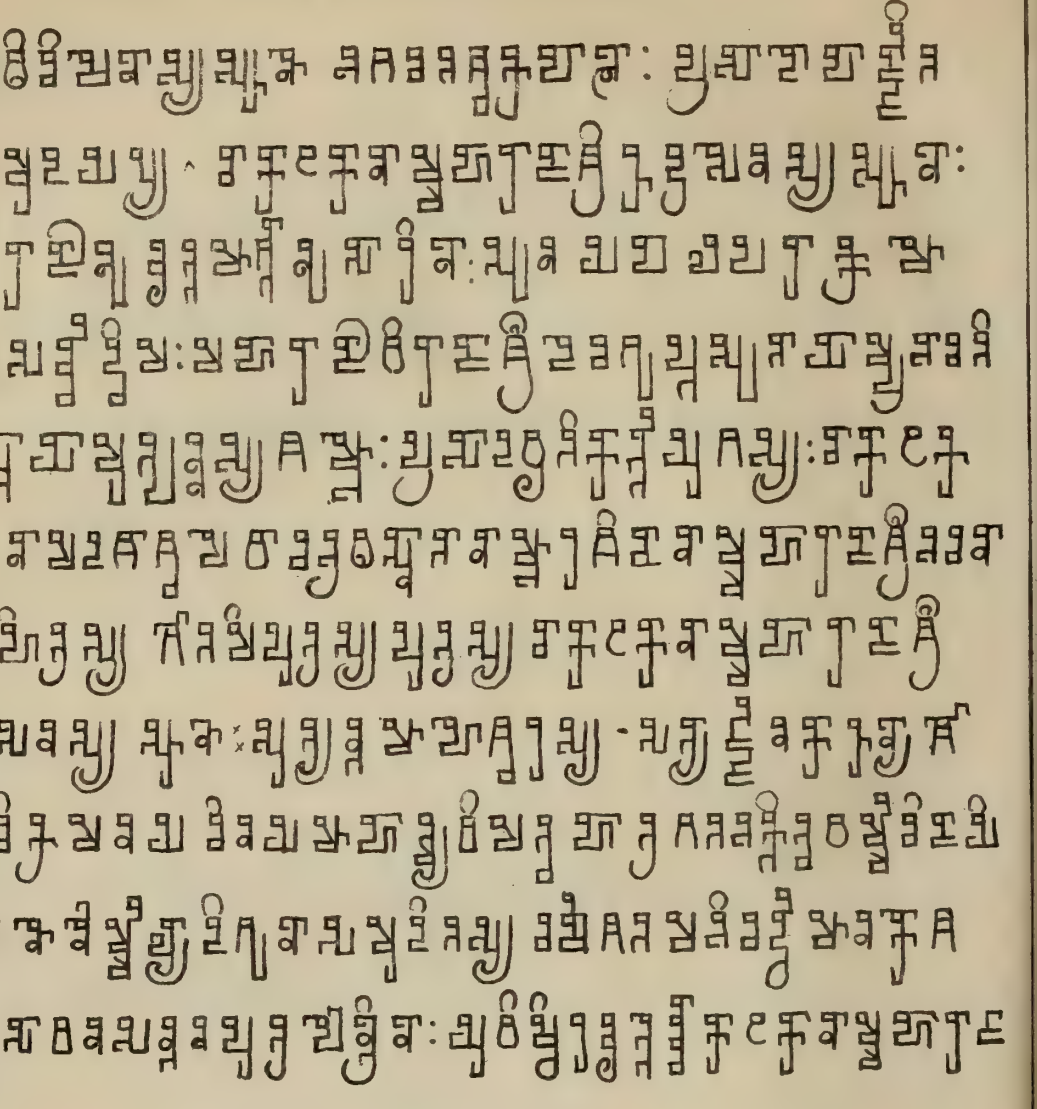
Seoní			Varieti
क	ka	ट	
ख	kha	ठ	
ग	ga	ड	
घ	gha	ढ	
च	cha	ण	
छ	chha	त	
ज	ja	थ	
झ	jha	द	
ञ	ña	ध	
ट	ṭa	न	
ठ	ṭha	प	
ड	ḍa	फ	
ढ	ḍha	ब	
ण	ṇa	भ	
त	ta	म	
थ	tha	य	
द	da	र	
ध	dha	ल	ळ
न	na	व	
प	pa	श	
फ	pha	ष	
ब	ba	स	
भ	bha	ह	
म	ma	ज्ञ	
य	ya		

var.	Vowels		var.
	अ आ	ए ऐ	
	इ ई	ओ औ	
	उ ऊ	अं अः	
	ऋ ॠ	ँ ं	
८	७	६	५

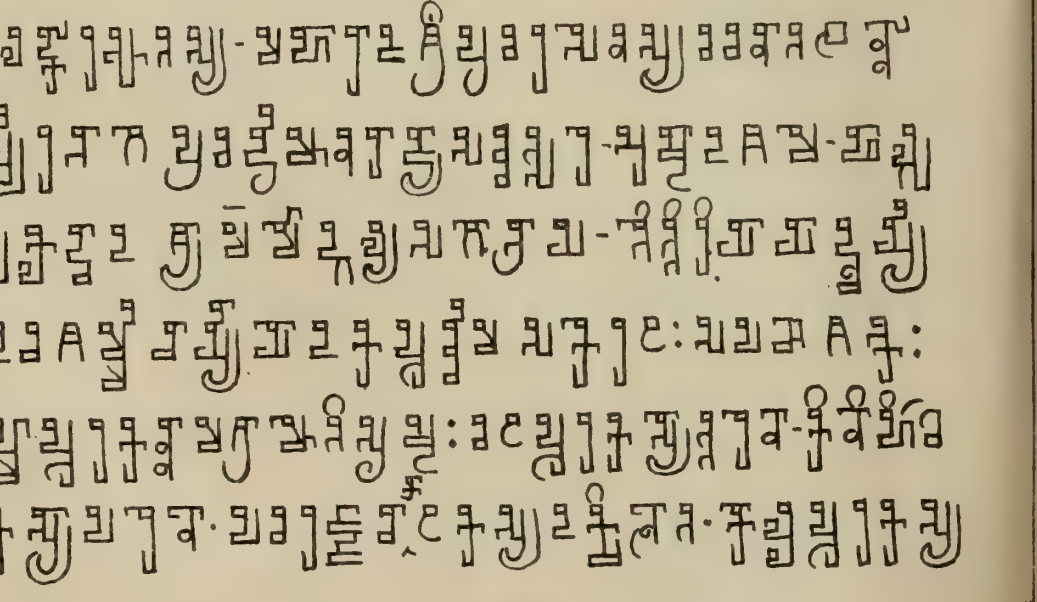


Second Inscription from Chunar, in As. Soc. Museum.

Second Plate of the Seoní Grant.



Third Plate, one side.



Received only within the last week, I have been so hurried in transcribing, translating, and lithographing, that I fear full justice has not been done. The order of the plates having been lost by taking them from their binding ring, I had to guess it from the connection of the reading—and on revising the first translation, with the aid of a second learned pandit (KAMALA KÁNT), I found I had inverted the order of the two sides of the second plate in the lithograph, which I was unable to correct, before printing it off. I have also omitted the first syllable *sthá* of *sthánè* where this word is repeated in the first page of the lithograph. The rest is, I believe, pretty correct.

The character in which the *Seoní* plates are written, when deprived of the open parallelogram at the head of each letter, is so closely allied to No. 2 of the *Allahabad* láth, that there could have been but little difficulty in decyphering it, even without the aid of SRÍ VARMA SURI's alphabet, which Mr. WILSON seems from his words to have applied with considerable distrust at that period*. There are indeed notable deviations from the *Chattisgarh* type† in several letters, as well as invariably in the application of the vowels. I had inserted VARMA SURI's alphabet in Plate XXXIII. with a few variations marked. I have now further noted some of the chief peculiarities at the foot of the last plate.

Concerning the purport of the inscription little need be said. It is an ordinary grant by one Rája PRAVARA SENA, of a piece of ground in a conquered district to his officiating priest, in perpetuity :—but neither the country nor the boundary villages mentioned, nor any of the said Rája's family can be recognized! The dynasties of *Cuttack*, the nearest resembling *Vákáṭaka* in sound, exhibit no such names as PRAVARA SENA, RUDRA SENA, PRITHIVI SENA, RUDRA SENA; and again PRAVARA SENA, who successively reigned over this unknown province. That they were of an inferior grade is shewn by their simple title of *Mahaṛája*, while DEVA GUPTA, whose daughter was married to one of the line, and was mother to RUDRA SENA II. is styled the paramount sovereign *(Maharája Adhiṛája)*. This is the second instance within a year of our finding the record of a matrimonial alliance with a *Gupta* family, which we can suppose to be no other than the one now so well known to us through coins and pillars. The present name DEVA GUPTA, however, is an addition to our still growing catalogue.

* "After two months the pandit was again called on without previous notice or preparation to read his copy of the original, whilst his reading was checked by careful reference to the Devanágarí transcript." As. Res. XV. 507.

† M. JACQUET has sent me from Paris the facsimile of a plate in the TOD collection, which corresponds more closely with the Chattisgarh plates.

What would have added still more to the value of the present document, is the exact date it cites, were it not unfortunately in an unknown era, entitled *Pravarddhamánarajya Samvat:* it may, however, bear the interpretation of "date of the growing (or current) reign" which I have adopted in the translation. At any rate, the omission of the now common dates in all these early records proves that the *Vikramáditya Samvat* was not then generally in use.

The omission of a benedictory invocation at the head of the inscription is a curious circumstance also noted in the *Chattisgarh* grant. The initial word *Dṛisthamasi*, may possibly be equivalent to "Take heed"—or "By these presents." Some of the epithets, especially those applied to the piece of ground, are too far-fetched even for a guess solution by KAMALA KÁNT and RAM GOVINDA, whose ingenuity has good reason to be admired even in those I have attempted to render into English. They refer to practices of petty exaction not uncommon among feudal chieftains.

Transcript of the inscription in modern character.

On the seal.. { वाकाटकच्छत्रामस्य
क्रमप्राप्तन्दपश्रियः
राज्ञः प्रवरसेनस्य
शासनं रिपुशासनं

दृष्टम
सिनम } अग्निष्टोमाप्तोर्य्यमोक्तषोडश्यतिरात्रवाजपेय दृहस्पतिसव

सायस्क्रचतुरश्वमेधयाजिनः विष्णुवृद्धसगोत्रस्य सम्र*ट [*सम्राजः काटकाना
म्महाराज श्रीप्रवरसेनस्य स्थाने स्थाने अत्यन्तस्वामिमहा
भैरवभक्तस्य इन्दुसन्निभग्रितग्रिवलिङ्गोद्वहनग्रिवस्य परितुष्ट
समुत्पादितराजवंशानाम् पराक्रमाधिगतभागीरथ्यमज्जलमूर्द्धाभि
षिक्तानाम् दशाश्वमेधावभृथस्नातानाम्भारग्रिवानाम्महाराजश्री
रुद्रसेनस्य स्थाने अत्यन्तमाहेश्वरस्य सत्यार्ज्जवकारुण्यौ
र्य्यविक्रमनयविनयमाहात्म्याधिमखद्योचगतभक्तिवधर्म्मविजयि
त्वमनोनैर्म्मल्यादिगुणसमुदितस्य वर्षशतमभिवर्द्धमानकोश्र
दण्डसाधनसन्ततपुत्रपौत्रिणः युधिष्ठिरवत्तेर्व्वाकाटकानाम्महाराज
श्रीपृथिवीषेणस्य स्थाने भगवतश्चक्रपाणेः प्रसादोपार्जित
श्रीसमुदयस्य वाकाटकानाम्महाराजश्रीरुद्रसेनस्य स्थाने
पूर्व्वराजानुवृत्तमार्गानुसारिणः सुनयबलपराक्रमो
च्छिन्नसर्व्वद्विषः महाराजाधिराज श्रीदेवगुप्तस्य सुतायाम्प्रभावती
गुप्तायामुत्पन्नस्य श्रीमः प्रसादधृतिकार्त्तियुगस्य वाकाटक
वंशालङ्कारभूतस्य महाराजश्रीप्रवरसेनस्य वचनात् एत्र
कार्य्यरतागे प्रवर्द्धमानराज्यसंवत्सरे अष्टादशमे फाल्गु
नशुक्लाद्वादश्याम् मौद्गल्यसगोत्राय तैत्तिरीयायार्द्धर्य्य
वे देवशर्म्माचार्य्यायोदकपूर्व्वम् सकेरटः सपणशतकः
ब्रह्मपुरकन्नामग्रामो विसृष्टः वटपुरकस्योत्तरेण किनौछिवा
टकस्यापरेण पवरज्जवाटकस्य दक्षिणेन कोल्लपुरकस्य

पूर्व्वेण ससीमापरिच्छेदेन करजाविरकतटे अत्रास्मत्सामन्ताः
सर्व्वाध्यक्षानियोगनियुक्ताः आज्ञासत्कारिकुलपुत्राधिकृताः भटा
श्चान्यांश्च विश्रुतपूर्व्वया आज्ञया आज्ञापयितव्याः विदित
मस्तु वः यथैषोस्माभिः आत्मनोधर्म्मायुर्ब्बलविजयैश्वर्य्यवृद्धये
इहामुत्र हितार्थमात्मानुग्रहाय वैजयिके धर्म्मस्थाने अभट
प्रवेश्यः अपारम्परगोवलिवर्द्दः अपुष्पचौरसन्देहश्च चा
रासनवर्म्माङ्गारः अलिव लिन्वक्रेराधनतः स्थवु विष्टिपरिहर
परिहृतः सनिधिः सोपनिधिः सक्षिप्तोपक्षिप्तः आचन्द्रादित्य
कालीयः पुत्रपौत्रानुगामी भुज्यमानो न केनचिद्बाधातयि
तव्यः सर्व्वक्रियाभिः स रक्षितव्यः परिवर्द्धयितव्यश्च यस्मात्
प्रशासनमगणयमानः स्वल्पमपि परिहृतं कुर्य्यात्कारयेत वा
तस्य ब्राह्मणैरावेदितस्य सदण्डनियहं कुर्य्याम कारयेम वेति
सेनापतौ नाप्यदेवेलिखितमाचार्य्येण ॥ अस्मिंश्च धर्म्माधिकरणे
अतीतानेकराजदत्तांश्च चिन्तनपरिपालनक्षतपु
ण्यमुत्कीर्त्तयामः वध्यन्तत्कालप्रभविष्णून् गौरवाद्भविष्यांश्च
ज्ञापयामः ॥ व्यासगीतौ चात्र श्लोकौ प्रमाणीकर्त्तव्यौ
षष्टिवर्षसहस्राणि स्वर्गे मोदति भूमिदः । आच्छेत्ता चानुमन्ता
च तान्येव नरके वसेत् ॥ स्वदत्तांम्परदत्तांवा यो हरे
त वसुन्धराम् । गवां शतसहस्रस्य हन्तुर्हरति दुष्कृतमिति ॥

Translation.

Of the seal. The irresistible edict *(sásanam)* of the illustrious prince of hereditary lineage, the ornament of *Vákáṭaka*, Rája Pravara Sena.

Of the copper plates. Dṛishtamasi nama.* The illustrious Maharája Pravara Sena of the race of Vishnu-rudra the rishi, performer of the several sacrifices of *Agnishtoma, Aptoryamekta, Shoṛasyatirátra, Vájapè, Vrishpati, Sadyaskra*, and the *Chaturasvamèdha*, ruled over the entire (province of) *Vákáṭaka.* In his place (succeeded) the superlative lord, devoted to Bhaírava—happy in being the vehicle of the moon-like† Siva-linga,—the great king of *Vákáṭaka*, Srí Rudra Sena, grandson of Gotami', the daughter of the great king Bhavana'ga‡ who was descended from a race of conquerors entitled to be inaugurated with the unsullied water of *Bhagirathi*, (the Ganges,) and who had bathed in the sanctified water of the *Dasasvamèdha* sacrifice,—the Bharasiva race. To him succeeded the diligent worshipper of Mahesvara§, the just, upright, benevolent, brave, heroic, moral, humble, high-minded, strict in religious observances, victorious through faith, of a soul free from blemish,—endowed with all these virtues ;—(who was) blessed with a century's store

* This might possibly be an invocation in the usual form, but no divinity of the name of *Dṛishtamasi*, of which the letters are quite distinct, is known.

† White. The epithet signifies a devoted worshipper of *Siva.*

‡ Or Bhavanátha? § Siva.

of treasures, of the benefits of civil polity, of warlike armament, of children and grand-children—who was as celebrated as YUDHISTHIRA, the great prince of *Vákáṭaka*, Srí PRITHIVI SENA. To whom succeeded, the protected of the discus-holding divinity*,—the most opulent Mahárája of *Vákáṭaka* Srí RUDRA SENA:—who was followed by the son of PRABHAVATI' GUPTA', the daughter of the conformer to ancestorial customs—the upright conqueror of his enemies—The great king of kings Srí DEVA GUPTA,—the protected of Siva,—possessing the firmness of the Rájas of the *Satya yuga*,—surpassing all of the race of *Vákáṭaka* princes, Mahárája Srí PRAVARA SENA; whose edict is (as follows.)—

Ernna Káryyaratáge†...in the 18th year of his reign‡? on the 12th day of the light half of the month of *Phalguna*,—to DEVA SARMA'CHA'RYA, chanter of the Sáma véda, of the *Modgala* tribe, and *Taitriya* sect, is granted with the ceremonies of sprinkling Ganges water, *Kérata* (?) and distribution of 100 *pans*,—the village of *Brahmapura*, situated to the north of *Vatapura*, to the west of *Kinauhi-vátak* to the south of *Pavarajja-vatak*, and to the east of *Kollapur*; demarked by these several boundaries, and seated on the banks of *Karanja* rivulet (?)

Be it known to all our subjects, our functionaries, and agents, to all obedient ryots now and hereafter, soldiery, spies §—That with the usual intent of such grants, for the increase of our virtue, life, power, wealth, and prosperity, here and hereafter, as well as for the divine favor; in the holy district recently conquered by us, (the said village is bestowed) free from military-billeting¶(?)—where the rája's deer and cattle shall not graze**—not subject to provide flowers and milk††. Where shall be neither spy, nor royal-chair, nor magazine ‡‡. §§? in which the inhabitants shall not be liable to *bègár* or forced labour;—along with its buried treasures and such like:—and with all its stock and the like;—as long as the sun and moon shall endure, to be enjoyed by him, his sons and descendants. Let none prevent or oppose; but defend (his possession)—and let him enjoy all increase by cultivation. Whoever shall disobey this order, or make encroachment or abstraction by himself or through others, shall be liable to fine or punishment before the judicial authorities.

Written by the pandit of the general BAPPA DEVA in this court of justice *(Dharmadhikaranè)*. Whatever pious fame has accrued to princes

* Vishnu. † The sense of this passage is obscure—one pandit by alteration to सूर्य्योपरागे would make it express "at a solar eclipse"—a common period for dating similar documents.

‡ *Pravarddhamán rajya Samvat?* § *Bhartas'chhánráscha.*

¶ *Avatacchatraprávèsya*—all the succeeding epithets laudatory of the jagir are equally far-fetched and obscure.

** *Apáramparagobalivarddah.* †† *Apashpakshírasandoha.*

‡‡ *Achárásanavarmangara* (for *ágára*). It was customary with rájas to keep an *A'san* or throne, a spy and armour at each village.

§§ *Alivanatlinvakrenidhanatra? Sarvavishti-parihara parihrita?*

of yore from similar acts should be remembered, and those who come hereafter should uphold them—(?). The holy VYAS has the following two verses to this effect:—

"He who bestoweth land on brahmans shall enjoy 60000 years' happiness in heaven; and he who resumeth it shall abide an equal term in hell. If he take away either by himself or by others, his sin is equal to that of the slaughter of a hundred thousand cows."

Inscription No. 6, of the Asiatic Society's Museum.

I have inserted this inscription in my series because it possesses an exact date, and because the original was not given in facsimile by Mr. COLEBROOKE when he transcribed its contents in his notice of various inscriptions in the ninth vol. of the Researches, page 433. There are, moreover, several letters misread in that copy from an imperfect acquaintance with the changes they have undergone in the course of ages: of these the *bh* is the most prominent, being taken from an *s**. The *Sárnáth* inscriptions of the same century have taught us its real value.

Still with these emendations the context hardly bears complete explanation, though the general object is clear. It states that in *Samvat* 1093 (A. D. 1035) on the 1st of the light half of *Asárh*, the paramount sovereign YASO PÁLA of *Káṭe* at the village of *Payahása* in the kingdom of *Kausambhí* (or *Delhi*) issues commands to the principal persons.... The following is the transcript as recompared with the original on the stone.

संवत् १०९३ आषाढ शुदि १

अद्येह श्रीमत्कटे महाराजाधिराजश्रीयशःपालःकोसाम्बमण्डले पयहासग्रामे महान्त मनुसमादिशति यथाभोसेकीयमाथुरविक्षय शासनत्वं प्रसादीकृत्य मत्वभाम भोधाकरहिरन्यपत्यदायादिकं मर्खोपनतयामिति दसवन्धेन सहयिकं ढालदतं पोवाक्षांभ.....दं

Inscriptions from Chunar.

The two fragments inserted in Plates XXXI. and XXXIII. were presented by Capt. CUNNINGHAM, along with the stone in more perfect preservation published in a former plate. All that can be said of either is, that as the name of SWA'MI-RA'JA appears on one, they probably relate to similar objects described by the larger one, viz. the repairs of public buildings in the fort of Chunar.

The *Buddha gaya* inscription of Plate XXXIII. was alluded to in my last notice.

* The *s* of this character enabled me to read some Ceylon coins of the same century.

VI.—*Some remarks on the development of Pollen. By* William Griffith, *Assistant Surgeon, Madras Establishment.*

Pollen of *Pardanthus Chinensis*, Ker. Nat. Order *Irideæ*.

At the earliest period submitted to examination, and when the perianth scarcely exceeds half a line in length, the anthers are sessile and nearly perfectly formed. The cells, of which (as is perhaps the case in all bilocular anthers) there are four, contain a solid grumous semi-opaque mass, which is easily detached from the cell by slight pressure. This mass under a lens whose focal distance is one-twentieth of an inch, shews evident traces of cellularity, but the outlines of the cells are very faint. They are entirely filled with exceedingly minute granular matter. At a somewhat later period the cellularity of the mass is more obvious, but no separation of the component parts has taken place, and the cells are still entirely occupied by the granular matter.

When the perianth has attained the length of a line and a half, the mass will be found to have become externally of an orange colour, and traces of a proper enclosing membrane, the cells of which are extremely indistinctly marked, are now visible. The membrane appears to have no connection with the interior of the loculus. The cells composing the mass have undergone some separation. They consist of a hyaline membrane which appears to be of some thickness; it is generally of a globular form, but often attenuate at one or both ends. The granular molecular matter which originally filled the whole cavity of the cell, now occupies a portion only, and never appears to lose its spherical form. When the perianth is two lines long, the proper membrane of the mass has become more distinct; its cells contain a good deal of granular matter of a reddish orange colour. The cells of the mass have become more separated, but have otherwise undergone no change; the semi-opaque nucleus presents traces of division most frequently into four, often into three, and very rarely into two portions. The division is more distinct towards the circumference of each cell; it may be observed in the same mass in every stage, from the commencement of the dividing lines to their meeting in the centre. The smaller masses or nucelli resulting from this division are each enclosed in a proper cell, but as yet have undergone no separation.

In the next stage the perianth had increased two-thirds of a line in length; the mass presented externally the same appearance. The component cells had increased in size, and the divisions of the nucleus had in many cases undergone complete separation from each other,

and in all were separable by slight pressure. Each of these divisions is at this period a young grain of Pollen. On making their escape they leave their proper cells attached to the interior of the parent cell, which is hence divided into as many cells as there are divisions of the nucleus. The young grains are oblong-ovate, flattened on their contiguous or inner faces, and open along the centre throughout the whole length of their outer faces. They are even at this period reticulate, and have rather a papillose appearance; they are lined by an inner membrane in the form of a hyaline sac which bulges out slightly along the opening just mentioned.

When the perianth is three lines long, the grains of Pollen have undergone complete separation; no traces of their original envelopes being visible. They vary much in size, are rather opaque, minutely reticulate, and marked along one side by a longitudinal semi-transparent line, which indicates the situation of the original opening, now closed up by the inflection of its edges. Immersion in water produces scarcely any action on them. At a later period, the perianth measuring five lines in length, the grains are considerably increased in size. Immersion in water causes the inflected margins of the furrow to secede, until they become widely separate. Through this the inner membrane bulges out to a considerable extent.

Perianth about six lines in length: the Pollen is now perfectly formed; the grains vary much in size, the smaller being probably abortive, but theya ll undergo the same changes on immersion in water. This causes the outer coat to be pushed back by the expansion of the inner, which is now nearly filled with minute granular matter.

At the time of dehiscence of the anthers the grains vary much in size: the more perfect are lanceolate in outline, of an orange colour, distinctly reticulate or cellular, and open on one side along the centre. This, however, is perhaps to be attributed to the excessive moisture of the climate. Immersion in water causes the very rapid bulging out of the inner membrane, which pushes back, and at length nearly entirely off, the outer one. This is filled with minute granular matter, the fovilla and burst of the immersion is somewhat protracted.

Stigmatic action causes the production of a tube or boyau from the inner membrane, the head of which tube continues to be covered partially by the outer coat.

This instance is interesting as an example of the development of Pollen by the division of an originally simple nucleus and of perfect and almost spontaneous separation of the outer coat, and lastly as

pointing out clearly the nature of the longitudinal furrows of such common occurrence in the ordinary forms of Pollen.

In the two other instances which I have selected as demonstrations, the steps are much the same. Care must be taken not to confound the appearance presented by the Pollen of *Luffa fœtida* at a late period of its development, and which evidently arises from the strong inflection of the outer membrane, with that occasioned by the much earlier dividing process.

In *Hedychium* I have been unable to examine the development at a sufficiently early period, but it appears to me the divisions of the original or parent cell form the outer coats of the subsequent grains of Pollen: this is certainly not usually the case. The Pollen of this plant is remarkably simple, for it is neither provided with furrows nor apparent pores.

The inner coat,—for I am disposed to believe that it has one,—adheres strongly to the outer, and none of the ordinary means are sufficient to ensure its separation.

As I have, since a portion of the above was written, received numbers of the Annales des Sciences Naturelles for March and April 1835, in which occur extracts of considerable length from the writings of Mr. Hugo Mohl, who has published lately (1834) at full length on this important organ, it may not be amiss here to state the principal results to which this botanist has arrived; noticing, however, only those which relate to development and structure.

After pointing out that in by far the greater number of cases, the inner membrane, which contains the fovilla, is enclosed in a second membrane, M. Mohl proceeds to a detailed account of the outer membrane. This is represented as being always finer than the inner, and as generally determining the form of the grain; and that it is to the liquid secreted by it that the colour and viscosity of the grain is to be attributed.

The punctuation which frequently exist in this membrane are supposed to be rudimentary cellules; hence the comparison of this coat to a simple cellule is altogether inexact; it should be considered as an organ composed of cellules or the rudiment of cellules, and a homogeneous uniting membrane, and hence it should be compared with compound membranes; such, for instance, as those of the ovule.

It is only in a small number of plants that this coat presents the form of a perfectly closed, continuous, sphærical sac; in most cases it is either furnished with folds or pores, or both.

Up to the period of M. Mohl's publication nothing whatever was known of the nature, functions, or number of these folds; most bo-

tanists, so far at least as may be judged of from their descriptions, considering them to be solitary. M. Mohl remarks, that in monocotyledones they are generally single, but that in dicotyledones the number is generally increased, and occasionally exceeds twenty. The portion that is folded in has always a different structure from the remainder, and is generally smooth and transparent; and it rarely ever happens that in cellular Pollen the inflected portion is itself cellular. He supposes that in all cases the outer membrane forms a perfectly closed sac, although in some Pollen the inflected portion has more of a gelatinous than a membranous consistence, and is ruptured by immersion in water. The apparent pores visible in the Pollen of many plants, M. Mohl states to be in all cases covered over by a thin membrane—to the existence of this membrane over the larger pores he speaks positively. In those cases in which the membrane covering the pore separates in the form of an operculum, it is attenuated alone along the margin of function or continuation with the remainder of the outer coat. These statements accord with the author's views of the nature of the supposed pores of cellular tissue; views, however, which have not been generally received, and which in the case of cellular tissue are open to weighty objections. The inner membrane is represented as always having the same structure; it is always completely homogeneous, very thin, and hyaline, and always exists as a shut sac. It is particularly remarkable for the facility with which it absorbs water; this M. Mohl looks upon as a physical action and as attributable to endosmosis.

The production of tubes (boyaux) by immersion in water, (and which are prolongations in all cases, except perhaps in *Coniferæ*, of the immediate covering of the fovilla) never takes place in those Pollens, the outer membrane of which is perfectly closed, or the folds or furrows of which are unprovided with pores. But in every Pollen they are produced by stigmatic action. The action likewise exerted on the grains by this portion of the female organ is more energetic than that of water, producing twelve or fifteen times the diameter of the grain; while the longest, M. Mohl observed, produced by the action of water only exceeded the grain in length once, or once and a half.

I may here state, that M. Mohl has understated the length of the tubes arising from stigmatic action. The length will depend upon the distance between the part of the stigma to which the grains are applied and the foramen of the ovulum to which they have to be applied. Thus, for example, in Zea mays, the length of the tubes must be enormous, since the style itself is about a span long. It may be

objected, that there is no proof of the universal necessity of the application of the tube to the foramen, or that portion of the ovulum corresponding to this. Still there is ample proof of this necessity in Asclepiadeæ; and, as I have observed it in *Solaneæ*, *Gentianeæ*, *Nelumboreæ*, and *Leguminosæ*, I have no doubt that the application of the tube to the foramen is absolutely necessary to insure fecundation. And with regard to the length produced by the action of water, I have seen tubes produced from the grains of Pollen in a species of *Impatiens*, I believe the *Impatiens tripetata* of Roxburgh, exceeding six or eight times the long diameter of the grain; these tubes, however, never even after protracted immersion contained any granules. Their growth in the above instance may be actually watched, the apex of the tube creeping along with an excessively slow vermicular motion.

M. Mohl states, that *Asclepiadeæ* alone have no outer membrane. The existence of this membrane as a distinct integument has been proved by Mr. Brown; although in almost all the species of this family, the outer coats are in a state of mutual adhesion*.

Coniferæ are said to have three coats; the intermediate one resembling the inner membrane of ordinary Pollen, especially in its great extensibility; in this property the innermost, although it has the ordinary structure of inner membranes of other Pollens, is deficient.

As I have mentioned before, this author considers the outer membrane as the secretory one, and he denies the possession of secretory powers by the papillæ; an opinion stated to be advanced by Mr. Brown. M. Mohl proves that the secretion of oil is not limited to any papillosity of surface; of this *Pardanthus Chinensis* is an instance.

This botanist doubts the proper activity of the molecules or granules contained in the fovilla, and he adduces the authority of M. Fraunhofer as to the utter impossibility of preventing currents in liquids.

* I find that the cells of the anther of *Oxystelma esculentum* are at an extremely early period lined by a free *simple* sac containing irregular masses of opaque granular matter; soon after, this cell appears to be filled entirely with the granular matter, by which it is rendered somewhat turgid. In this state it is detachable with extreme difficulty. When the flower bud is two lines long, the mass has become cellular, and the granular matter correspondingly subdivided. The subsequent changes consist merely in the increase of size and consistency of the parts, and perhaps in the development of the inner membrane. We may hence be allowed to infer that the mass, from which all Pollen grains seem to be developed, is in *Asclepiadeæ* reduced to a single cell: and that the grains are produced by its indefinite division. The only material objection to this view exists in the original cell itself entering into the composition of the grains of Pollen; and in its not disappearing, as appears to be generally the case.

Still I conceive it impossible to doubt the inherent mobility of these granules. In some oily Pollens granules may be observed by the sides of excessively minute drops of oil, certainly not exceeding the larger granules twice in diameter; and yet the granules will be seen in active motion, and the oil perfectly stationary. M. Mohl contradicts positively the curious fact advanced by M. Adolphe Brongniart, that the granules are in some plants of the same size. Of this I certainly have never met with an instance. He likewise doubts the curvature of some molecules; but as Mr. Brown and M. Brongniart speak positively on this point, I should prefer adopting their testimony.

It is, likewise, said, that the idea of the granules nourishing the tubes is untenable, and founded only on conjectures. But as it invariably happens that the longer the tube is the fewer the granules are, this opinion, which was I believe first indicated by the highest of all authorities, Mr. Brown, cannot be said to be destitute of foundation.

With regard to the development of Pollen, M. Mohl states that his observations entirely confirm those of M. Brongniart, and that the Pollen is formed from the granular matter contained in the cells of the parenchymatous mass, which exists in each cell of the anther. But although M. Brongniart certainly appears to have been the first to have observed the formation of pollen by division, yet his account in his "Memoire sur la generation et le developpement de l'embryon dans les vegetaux phanerogames," is certainly not characterised by that precision which exists in the account of the development of the Pollen in *Tradescantia virginica* by Mr. Brown, and subsequently in that of *Cucurbita Pepo* by M. Mirbel.

This latter, indeed, was the first instance examined by M. Brongniart, who states that what are now known to be lines of division result from pressure. It still remains to be proved whether in any instance the formation takes place, as M. Brongniart says it does, in *Cucurbita Pepo*, by the cellules of the mass contained in the cavities of the anthers becoming directly grains of pollen. M. Mohl mentions many instances in which the quaternary division is resorted to; it is owing to the continuance of the original adhesion that the pollen of many plants is compound. The number, however, is not in every case thus limited: the generality of the species of *Mimosa*, *Acacia*, *Inga*, have pollen composed of sixteen cellules. But on the development of these no direct observations have as yet been given. The number of masses into which the originally simple nucleus may be divided, is almost as frequently three as four. Of the binary composition of the mature Pollen *Podostemon* affords the only instance as

yet known to me, but this may obviously arise as well from a quaternary as a binary division of the nucleus.

M. Mohl rejects very properly as highly improbable the opinion of M. Brongniart, that the granules of the fovilla are secreted by some part of the inner surface of the cells of the anther, and that they reach their destination, the cavity of the inner membrane of each grain, by absorption. It must, however, be remembered that M. Brongniart alludes to this mode of formation and transmission with considerable doubt.

Lastly, M. Mohl notices the extreme similarity between the formation of the pollen and that of the sporules of the more developed *Cryptogamia*. I am not aware who first pointed out this curious analogy, which cannot well have escaped any one who has examined both formations at a sufficiently early period. My first knowledge of it is due to M. Mirbel, who pointed it out to me early in 1832*.

Explanation of the figures, Plate XLI.

1. Portion of a mass extracted from a loculus; perianth 1 line in length.
2. Ditto ditto; perianth $1\frac{1}{2}$ line in length.
3. Three of the component cells of a mass; perianth $1\frac{2}{3}$ line long.
4. Four similar cells more developed; perianth about 2 lines long.
5. Portion of a mass enveloped in its membrane, extracted from the cell of an anther; perianth 2 lines in length.

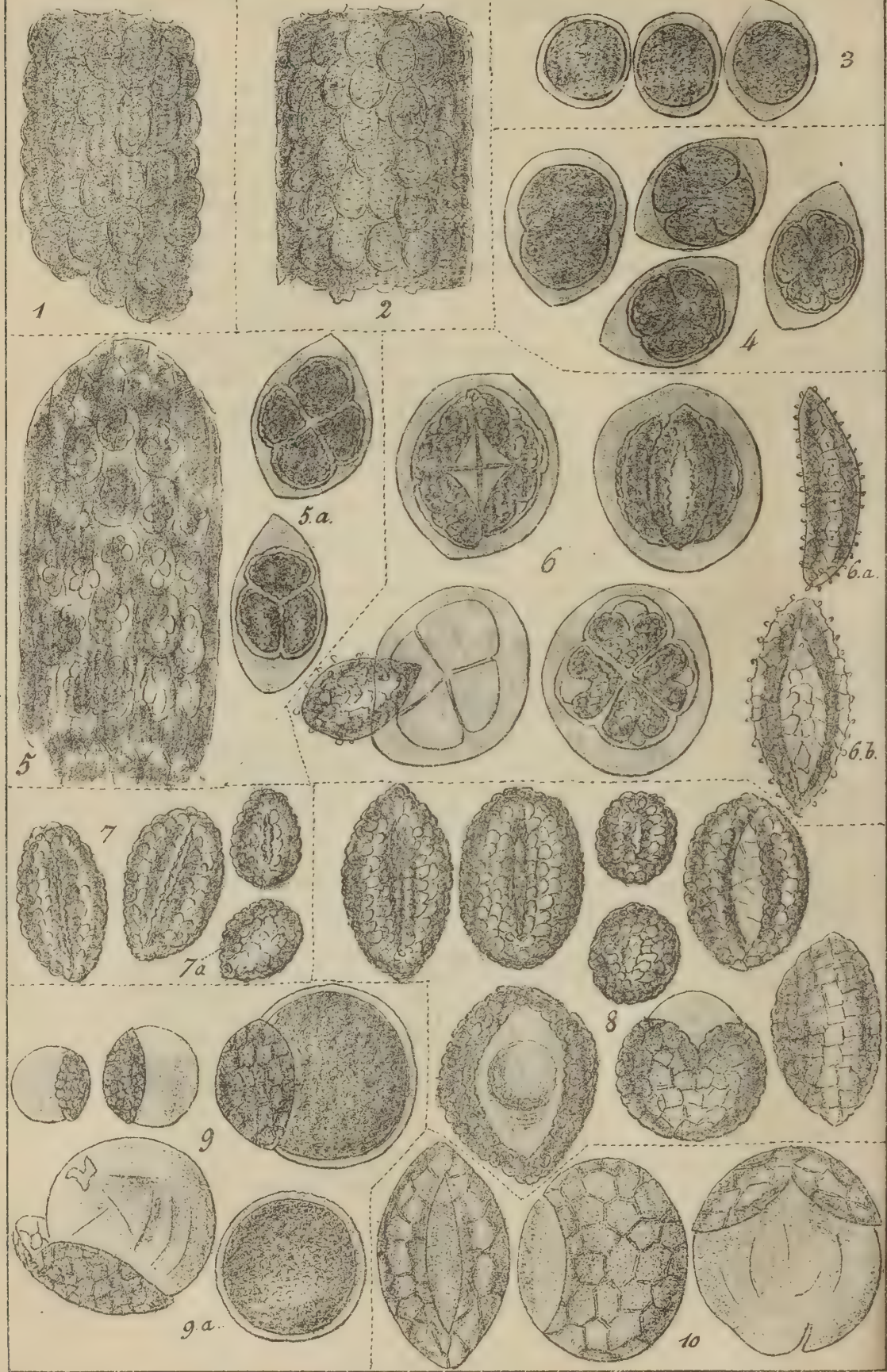
5*a*. Two of the component cells detached.

6. Four of the cells detached: (perianth $2\frac{2}{3}$ lines long:) viewed in different aspects:—from one, three nuclei have escaped, and the fourth is half exserted.

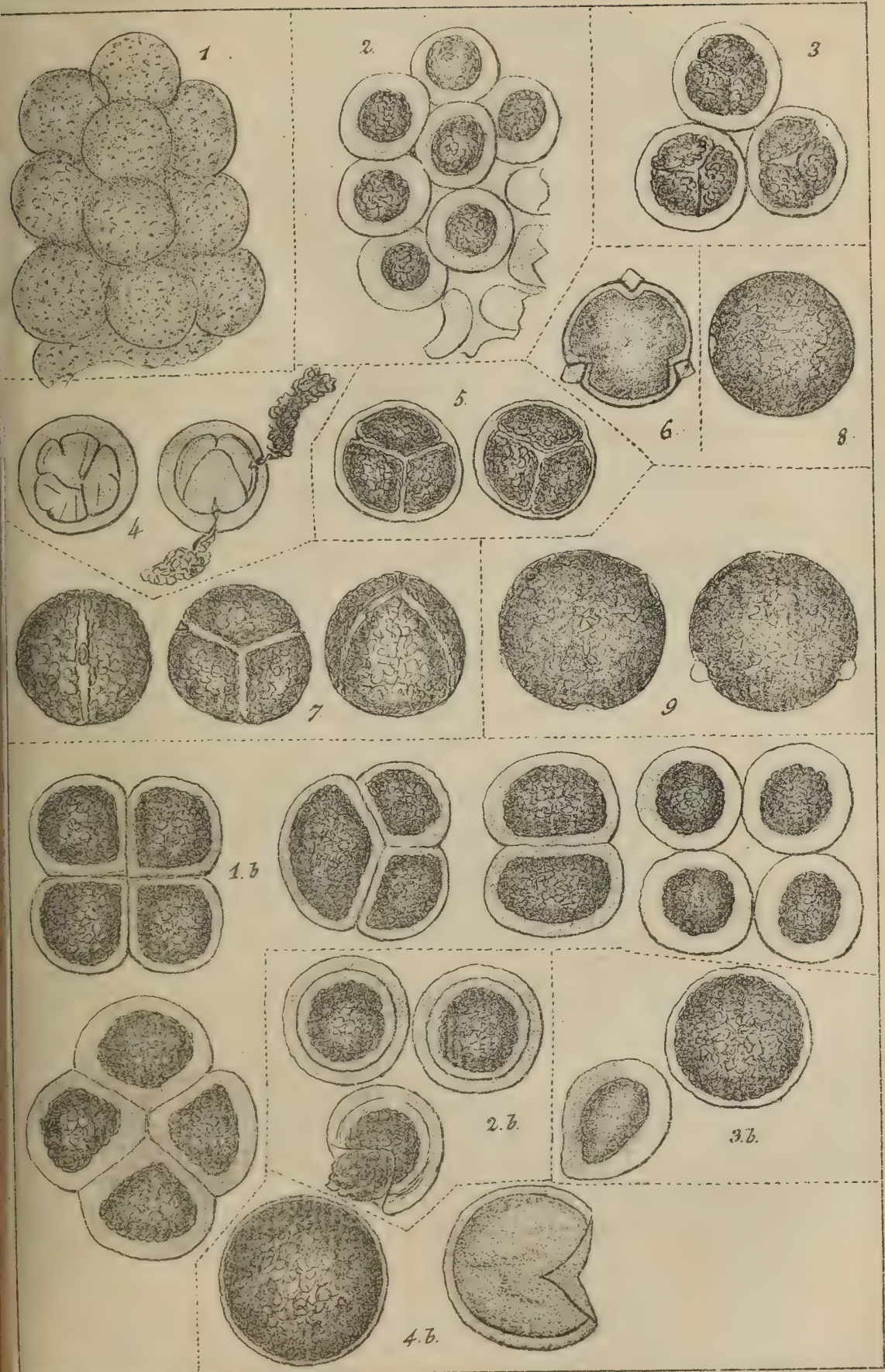
* *Equisetaceæ* do not, as might be supposed from their late elevation into an order of *Gymnospermæ*, differ from the higher forms of *Cryptogamia* in the development of their sporula. The spiral fibres, as might be expected, are of comparatively late appearance, and they are developed on or in a loose membranous coat, no traces of which are to be found until the sporula have assumed their proper form. The fibres subsequently, and about the time of the development of the fibres of the cells of the inner parietes of the capsules, become free, the membrane to which they were attached remaining as an envelope to the sporule, from which it subsequently becomes separable with facility. The granules are of still later appearance.

To the correctness of the chief portions of the above statement I can speak with tolerable confidence, but I only infer that the hyaline envelope of the perfect sporule is the mature state of the tunic, to which the spiral fibres are originally attached.

There would hence appear to be no foundation whatever for the adoption of the idea of the sexuality of *Equisetaceæ*,—an idea very likely to meet with advocates from its extreme ingenuity. The analogy of the fibres or supposed filaments is to be looked for in the elaters, and of the tunic or envelope in the tunic of the sporules of many *Hepaticæ*.



Oriental Lith. Press, Calcutta.



Oriental Lith. Press. Calcutta.

6*a*. Lateral view of the nuclei or young grains of Pollen.

6*b*. Vertical view of ditto on its outer face.

7. Pollen immature: the perianth being 3 lines in length.

7*a*. Represents what was the inner face prior to the escape of the nucleus from the cell.

8. Pollen viewed variously; perianth 5 lines in length, shewing the various degrees of expansion of the fissure according to the length of immersion.

9. Pollen: perianth 6¼ lines long. 9*a*. Inner membrane escape.

10. Perfect Pollen. 10*a*. Grain viewed as an opaque object.

Plate XLII. A.

Pollen of *Luffa fœtida*.

1. Portion of a mass extracted from one of the cells of an anther: flower-bud one and half line long.

2. Portion of a mass more advanced: the component cells adhering together firmly. Flower-bud about two lines long.

3. Cells of a mass more advanced: they cohere very slightly. Perianth two and half lines long.

4. The same submitted to slight pressure, shewing that each nucellus is contained in a separate cell.

5. Cells more advanced.

6. Pollen perfectly formed, but destitute of granules. Flower-bud about three and half lines long.

7. Three grains of Pollen considerably more developed; in the centre of each fold there exists a pore. Flower-bud four lines long.

8. Pollen: the folds have disappeared. Flower-bud five lines long.

9. Perfect Pollen.

All more or less magnified, and all examined in water.

Plate XLII. B.

Pollen of a species of *Hedychium*.

Fig. 1. Five *original* cells in various states of composition and cohesion. Perianth three lines long.

2. Grains of Pollen resulting from the complete separation of the above: an inner disc is visible at this period. One grain has burst by pressure.

3. Two grains of Pollen, one abortive. Perianth one inch long.

4. Perfect Pollen: one grain ruptured by pressure.

All more or less magnified, and all viewed in water.

VII.—*Sub-Himálayan Fossil Remains of the Dádúpur Collection. By Lieuts.* W. E. Baker *and* H. M. Durand, *Engineers.*

Quadrumana.

Lyell, when combating the inconclusive evidence advanced in support of the theory of the progressive development of organic life, notices the absence of remains of quadrumanous species in a fossil state, and the hypothesis which this circumstance has by some geologists been considered to countenance. He, however, draws attention

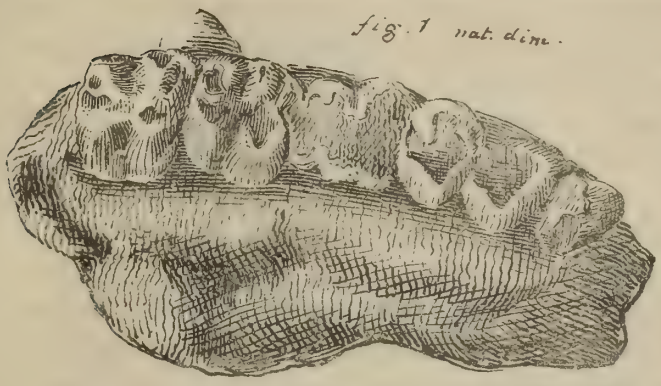
to the fact, that the animals which are found in sub-aqueous deposits, are in general such as frequent marshes, rivers, or the borders of lakes, and that such as live in trees are very rarely discovered; he adds, moreover, that considerable progress must be made in ascertaining the contemporary pachydermata before it can be anticipated that skeletons of the quadrumanous tribes should occur. Considering the great number of relics assignable to the *Pachydermata, Ruminantia,* and *Feræ,* which the Sub-Himálayan field has produced, it is not therefore surprising that at length the half jaw of a quadrumanous animal should be brought to light: the circumstance, however, being interesting in several respects, we have not deferred its communication until further research should put us in possession of more perfect specimens; the chances are against the probability of more being brought in for some time—in the interval it may be as well at once to add to the Sub-Himálayan list of fossils one species belonging to the order of the quadrumana.

The specimen in question was found in the hills near to the Sutlej, and it appears from the attached matrix to have been derived from a stratum very similar in composition to the one described as occurring at the Maginund deposit. The fragment consists of the right half of an upper jaw; the molars as to number are complete; but the first has lost some of its exterior enamel: and the fifth has likewise had a portion of the enamel from its hind side chipped off. The second and third molars are a good deal worn, and the state of the fourth and fifth such as to indicate that the animal was perfectly adult. The canine is small, but much mutilated, its insertion into the jaw and its section being all that is distinct.

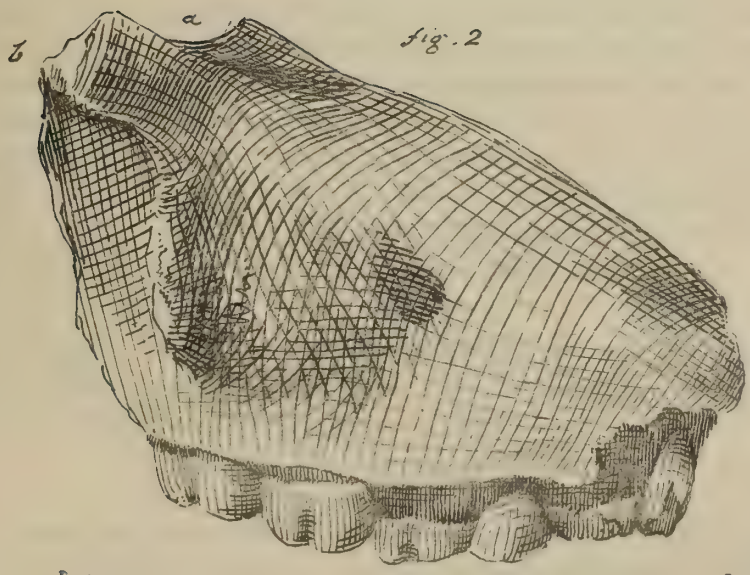
From the inspection of the molar teeth, the order to which the animal belonged is sufficiently evident; but there is enough of the orbit remaining to afford additional and very satisfactory proof; the lower part of the orbit and the start of the zygomatic arch being very distinct, would alone remove all doubt from the subject; the orbits of the quadrumana being peculiar and not easily to be confounded with those of other animals.

On comparison with the delineations of the dentition of this order of animals given by F. Cuvier, the fossil bears some resemblance to the genus *Semnopithecus;* the section of the canine and the form and size of the false molars are very similar to the exemplar taken by F. Cuvier from a head of the species *Maurus,* a species found in Java: had the drawing been taken from the *Entellus,* a species which inhabits India, the comparison would in this instance have been more

Sub Himalayan fossil Remains



Quadrumana



Baker del. J. Prinsep lith.

satisfactory; the *Maurus* being chosen as the type, and no mention made of other difference except length of canines, the various species may be supposed to present no material departure from the type in form of molars. The third molar in the fossil is so much worn as not to admit of being compared with drawings from unworn teeth; the fourth is like that of the *Maurus*, but the fifth does not resemble the analogous molars of any of the existing species as represented by F. Cuvier, for the fossil tooth possesses a small interstitial point of enamel at the inner side, which does not appear to have place in any of those delineated. The incisors are absent, but the intermaxillary is clearly distinguishable.

Were it not for the size of the canine and the fifth molar, the specimen presents some resemblance to the genus *Macacus*, given as the type of the genera *Macacus* and *Cynocephalus;* the smallness of the canine and the large size of the molars causes the fossil to approach more nearly to the *Semnopithecus* than to the *Macacus;* the difference is, however, great between the two, for the *Entellus* is said to attain the length of three and a half feet, whereas the length of the fossil animal, if the space occupied by the molars and their size be deemed sufficient ground for a conjecture, must have been equal to that of the *Pithecus Satyrus*—the space taken up by the molars is 2.15 inches. This circumstance, and the differences before pointed out, clearly separate the fossil from the species belonging to the genera *Cynocephalus* or *Semnopithecus*. The specimen is imperfect, but it indicates the existence of a gigantic species of Quadrumanous animals contemporaneously with the Pachyderma of the Sub-Himálayas, and thus supplies what has hitherto been a desideratum in Palæontology—proof of the existence, in a fossil state, of the type of organization most nearly resembling that of man.

Note.—Fig. 2 in the Plate is a little foreshortened in order to show the bottom of the orbit at *a*, which in an accurate profile view is hidden by the ascending part of the orbit, the section of which is seen at *b*.

Both figures were taken with the camera lucida.

VIII.—*Descriptive Catalogue of a collection of Land and Fresh-water Shells, chiefly contained in the Museum of the Asiatic Society. By* W. H. Benson, *Esq. B. C. S.*

Part 2.—Fluviatile Shells.

(Continued from page 358.)

19. *Planorbis umbilicalis.* Testa quasi dextrâ luteo-corneâ, politâ, leviter radiato-striatâ, infrà excavato-depressâ, anfractibus omnibus versus umbilicum profundum spectantibus, ultimo interiores penè

tegente ; suprà convexâ, versùs apicem planatâ, apice concavo, omnibus anfractibus satis apparentibus : periphæriâ obtusè angulatâ. Diam. 0.3 poll.

This shell, belonging to the same division of Planorbis as the British species *Pl. fontanus*, *(Pl. nitidus*, Lamarck,) in which the whorls on the inferior side are nearly covered by the succeeding ones, may easily be distinguished from that species, which it resembles also in colour, by the greater convexity of the last whorl towards the periphery, and by the slope towards the penultimate whorl, on the under side ; while in *Pl. fontanus* the convexity is next to the penultimate whorl, and the slope tends towards the circumference. The disposition observed in *Pl. umbilicalis* occasions a great concavity on the under side of the shell. The superior margin of the aperture, as in most of the depressed Planorbes, projects much behind the inferior margin, occasioning a great obliquity from the plane of the axis. The North American species *Pl. deflexus* and *Pl. exacuens* of Say, more especially the latter, have an affinity to this shell, which is probably an inhabitant of the streams of *Silhet*.

20. *Planorbis trochoideus*. Testâ quasi dextrâ diaphanâ, subtrochiformi, suprà glabrâ, rotundato-convexâ, apice concavo-depresso quasi umbilicali ; anfractibus omnibus parùm apparentibus, saturâ excavatâ divisis ; infrà radiatim striatâ, truncatâ, planatâ, umbilico contracto. Anfractu ultimo majori reliquos amplectente, suprà penè, infrà omninò obtegente ; periphæriâ acutâ.

The last whorl altogether conceals the other whorls on the lower face of the shell, leaving merely a contracted umbilicus in the centre, towards which the flattened surface declines. On the upper side only a small portion of the depressed spire is shewn, the whorls being rather compactly wound. The species differs from all others hitherto described in the singular truncated form of the inferior surface, and in the circumstance of the last whorl winding closely round the axis, as in many Helices and Trochi, without the intervention of the preceding whorls, none of which are visible in the very contracted umbilicus. The only shell of the genus which bears any very near resemblance to it in the formation of the under side, is *Pl. fontanus* of British authors, *(Pl. nitidus* of Lamarck,) the umbilicus of which is unusually contracted when compared with other species of the genus, but still exhibits within its vortex the whole of the preceding whorls, and so does not deviate from the recorded generic character ; while the species now brought to notice renders nugatory, as far as it is concerned, two important characters of Planorbis, viz. " anfractibus omnibus utrinque conspicuis," and " aperturâ ab axe remotissimâ." For the

present, considering that a similar variation of character in Trochus and Helix has not prevailed to separate species from those genera, I have not thought it necessary to detach *Pl. trochoideus* from Planorbis, but am inclined to consider it as one of the terminal species; merely prefixing to each of the characters above quoted the word "crebriùs."

As this form does not belong to the *Silhet* collection, and is an inhabitant of the neighbourhood of *Calcutta*, I intended to have included it in a paper on some other new Bengal species; but as it is desirable, in consideration of its interesting and anomalous structure, that its publication should not be delayed until I can devote leisure to their description, I seize the present opportunity for making it known.

The only specimens met with were taken by me, in August 1835, in the gardens of *Barrackpur* Park, near a tank, on the margin of which are some artificial ruins. They inhabited large earthen vessels filled with water, containing aquatic plants, and adhered to the prone surfaces of the floating leaves in company with a small Planorbis*, and a small lengthened Lymnæa which approaches in its characters to *L. chlamys* of this catalogue.

21. *Planorbis compressus*, Hutton, J. A. S. vol. iii. p. 91, No. 12.

The *Silhet* specimens scarcely differ from weathered individuals of Lieut. Hutton's shell, in which the extremely delicate carina, which margins the angular periphery in perfectly fresh specimens, is more usually found to be obliterated. The depressed whorls are equally visible on each side, and are highly polished in recent examples. They occur in great perfection near *Banáras*, adhering to the floating foliage of Trapa natans, and occasionally swimming at large on the surface of jhíls. This is the species alluded to by me as *Planorbis B.* in page 264, vol, i. *Gleanings in Science*, and figured as No. 10, Plate VIII.

22. *Planorbis Indicus*. Pl. corneus? Hutton, J. A. S. vol. iii. p. 90, and Benson, Gleanings in Science, page 264, Plate VIII. fig. 6.

Testâ discoidea, albidâ vel corneâ, supernè plano, suturis excavatis, umbilico depresso; subtùs planato-depressâ, latè umbilicatâ; anfractibus ventricosis transversè profundè et eleganter striatis ætate varicibus munitis. Aperturâ rotundatâ, auriformi, minimè obliquâ.

Pl. Indicus is scattered over the whole of the Gangetic provinces, and scarcely a pool of water can be found destitute of it. The *Silhet* specimens prove to be a small corneous variety occasionally to be

* I omitted to take specimens of this shell, which is either *Pl. compressus* of Hutton, or a new Calcutta species, *Pl. nanus* mihi, which is very similar to the British species *Pl. albus*.

met with to the westward. In some waters the species attains a great size, being 0.9 of an inch in diameter, and nearly equalling in magnitude *Pl. corneus*, which it resembles in general appearance, but from which it will be found to differ in the depth and regularity of the striæ, in the comparatively less profound excavation of the sutures on the upper side, and less profoundly sunk apex, as well as in being somewhat less ventricose. The animal is most commonly of a black olive colour, occasionally dark maroon red.

In the foregoing descriptions of Planorbis I have used the words upper and lower with reference to the faces of the disc which adjoin respectively the back and foot of the animal when creeping. The animal of Planorbis is undoubtedly sinistral, but if the shell be viewed as such practically, and placed with the side which would in a sinistral shell be accounted the apex uppermost, it will be found that the animal is on its back, and that it will have to twist its body half round in order to gain the ground with its foot; and that in order to creep with any ease, it must reverse the position of its shell. This will be more especially observable in the flatter and more oblique mouthed species. I propose, therefore, to consider that face as containing the apex, in discoid shells, which is contiguous to the back of the animal. This side may invariably be known in Planorbis by the greater projection of the lip in that part, by the deeper depression of the central umbilicus, and by the more considerable involution of the whorls occasioning a greater depth of suture.

Observers have, in general, adhered to no fixed rule on the subject, and have been guided chiefly by the aspect of the shell. Turton's characters of *Pl. fontanus* and *Pl. contortus* afford an instance of the same side being considered the upper in one species, and the lower in another. Lamarck was more consistent, and while he rightly viewed the shell as sinistral, called, in every species, that side of the shell which is contiguous to the back of the animal, the lower face. On the other hand, it is evident, from Say's description of *Pl. deflexus* and *Pl. corpulentus*, and from his denominating those species dextral, that, in those shells at least, he has followed the contrary rule.

23. *Lymnæa chlamys.* Testâ translucente, corneâ aut castaneâ, elongato-ovatâ; spira gracili, breviore, acuminatâ; anfractu ultimo infrâ præcipuè ventricoso; suturis parcè depressis; aperturâ infrà patente, basi leviter evasâ.

The Lymnæa in the *Silhet* collection is the chestnut-coloured variety. The paler kind is met with in great perfection in *Lehtára* jhíl, near *Banáras*, in company with Planorbis compressus, and another fine Lymnæa which I designate as *Lymnæa Butta*. The *Silhet* shell has an

eroded spire, and consequently wants the graceful appearance of the western variety. I at first described it as a distinct species, but a comparison with a good series from *Banáras*, where the species is very variable, has led to their reunion.

Lieutenant Hutton has referred the species with a mark of doubt to *L. limosa*, which it in no wise resembles. In perfect specimens the spire occupies about one-fifth of the total length. Greatest length of the shell 1.4 inches.

24. *Paludina oxytropis.* Testâ tenui ovato-conicâ olivaceâ, decussatim striatâ; anfractibus supernè carinis plurimis fuscis ornatis, ultimi carinâ mediâ saliente subacutâ; infernè fasciis quibusdam elevatiusculis fuscis; suturis inconspicuis; apice acutâ; canali umbilicali excavato; aperturâ intùs violaceâ, peristomate acuto, nigro. Long. 1.7 poll. Lat. 1.3.

This is a very remarkable and elegant species. Some of the specimens are, I believe, much larger than the one described.

25. *Paludina Lecythis.* Testâ tenui, globoso-conicâ ampullaceâ, olivaceâ, glabrâ, rugis obsoletis decussatâ; spirâ obtusiusculâ; anfractibus valdè ventricosis, rotundatis; suturis excavatis; aperturâ intùs violaceâ spiram longitudine superante; peritremate nigro, subreflexo; umbilico evanescente.

The striæ of growth, or rather the indications of former lips, are very frequent and prominent near the back of the outer lip; the rest of the shell presents that facet-like appearance which is so remarkable in some Lymnææ. I was at first inclined to consider this shell to be Gray's *Pal. Chinensis*, figured, but not described, in Griffith's Cuvier; but our shell is much more ventricose, the sutures are more pronounced, and it is deficient in the angular appearance observable at the base of the aperture in the Chinese species. It is a very thin shell in proportion to its volume. The epidermis is greenish olive in young specimens, reddish fuscous in the adult. Long. 2 poll. Lat. 1.7.

25½. *Paludina Bengalensis*, Lamarck. Idem. var. balteata, fasciis elevatiusculis.

26. *Paludina crassa*, Hutton's MSS. and J. A. S. vol. iii. p. 90, No. 5.

Testâ ovato-conoideâ, ventricosâ, solidâ, pallidè virente, obsoletè fasciatâ, rugis exilissimis decussatâ; anfractibus tumidis, suturis excavatis; spirâ obtusâ; umbilico subcanaliculato; aperturâ intùs lactescente. Long. 1 poll.

This species varies in configuration even in the same waters, some specimens approaching to a subglobose form, while others have a

more lengthened conoid spire. It is very abundant in the river *Gúmtí* at *Jónpur*, where it is paler, and has a more yellowish tinge than the *Silhet* variety, which, from having an eroded summit, appears to have inhabited stagnant water. It has a singular habit, for the genus, of burying itself in the mud or sand in shallow water, often in large societies; other species conceal themselves in the mud in the season of drought, but *P. crassa* does so from choice, and is impelled by no such necessity. The shell of the lately excluded young is so depressed and globular, that it might be easily mistaken for a young Ampullaria. The adult shell attains a degree of thickness unusual in the genus.

27. *Paludina pulchella*. Valvata, No. 9, Hutton, J. A. S. vol. iii. p. 90.

Testâ ovato-conicâ leviter striatâ, epidermide olivaceâ; anfractibus rotundatis, suturis depressis. Aperturæ peritremate nigrescente; umbilico arcto. Long. 0.3 poll.

Aperture occupying half the length of the shell.

28. *Ampullaria*. The specimens of this shell, which is common in Bengal, are much superior in size to any which I have met with west of the *Brahmaputra*. As I have reason to believe that the species is described, I shall content myself with this allusion to it. I should have considered it to be *A. fasciata* of Lamarck, were it not that that species is said to have a corneous operculum.

29. *Melania variabilis*. Testâ elongato-turritâ solidâ olivaceâ vel piceâ, sub epidermide albidâ; anfractibus convexis transversè liratis, longitudinaliter striatis et costatis; costulis anfractûs ultimi supernè nodulosis; apice plerumque truncato; suturis excavatis. Aperturâ intus violaceâ, columellæ basi sinuatâ.

Inhabits the river *Gúmtí* at *Jónpur*, and Tolly's nullah near *Calcutta*.

Var. A. Anfractuum inferiorum liris elevatis, nodulis elevatioribus. Inhabits river *Húghlí* at *Calcutta*.

Var. B. Liris, medianâ exceptâ, obsoletis; nodulis subspinosis carinam humeralem coronantibus.

Var. C. Lævis liris costulisque obsoletis, anfractûs ultimi medio subcarinato, adulti nodulis humeralibus frugaliter sparsis.

Var. D. Anfractuum superiorum costulis obsoletis, ultimi et penultimi liris transversis costulis longitudinalibusque supernè serie duplici nodulosis.

Varieties B, C, and D are in the *Silhet* collection. The type specimens of several of these varieties would, if viewed apart, be easily mistaken for distinct species, but they melt into each other so gradu-

ally, occasionally shewing the characters of more than one variety combined in the same shell, that no doubt remains of their blending in one species. In Tolly's Nullah I took larger specimens than any in the collection; though at least four twists of the spire were defective, one individual measured 3.4 inches in length. The *Gúmtí* specimens are less liable to truncation, and in young specimens the apices are nearly perfect. I have not observed more than 12 whorls present in any specimen. I described the type of the species without a name as species A* in the 13th No. of the *Gleanings in Science*. It was figured as No. 7, in Plate VII. vol. i.

30. *Melania Stephanus*. Testâ ovato-conicâ, gradatâ, plerumque deinde truncatâ globoso-ovatâ, olivaceâ anfractibus obsoletè fasciatis, transversè sulcatis, supernè planulatis, spiris brevibus validis coronatis; aperturâ albidâ subrotundatâ, supernè ferè angulatâ; labro subdenticulato.

This shell, which is very solid, approaches in form to *M. Amarula*, but differs from it in the configuration of the aperture, and in the comparative shortness of the whorls, as well as by the denticulations on the inner edge of the labrum. Among the numerous specimens which I had an opportunity of inspecting, only a single individual was perfect, and the greater number exhibited only two whorls, the remainder being truncated. This character I find to be an usual indication of habitation in stagnant water. The sulcations on the whorls are sometimes obsolete.

31. *Melania zonata*. Testâ ovato-conicâ, lævi, longitudinaliter striatâ, olivaceâ, zonis tribus brunneis fasciatâ; anfractibus leviter convexis, suturis minimè profundis; aperturâ albidâ ovato-oblongâ infrà subangulatâ. Long. 0.85 poll.

This a very distinct and pretty species, with a strong epidermis. It is generally eroded at the apex.

32. *Melania Terebra*. Testâ elongato-turritâ, olivaceo-brunneâ, lævi, politâ; anfractibus tumidis; suturis excavatis; sinu inter basin labri columellamque nullo. Long. 1.05. Testa truncata.

It is distinguished from the young of the smooth variety of *M. variabilis* by the want of angularity at the centre of the lower whorl, by its polished epidermis, more tumid whorls and more deeply sunk sutures, as well as by the absence of the sinuation of the inner lip which characterizes that species. The apex of the shell is more or less truncated.

33. *Melania conica*, Gray? Testâ solidâ, globoso-conicâ, longitudinaliter striatâ plerumque transversè obsoletè sulcatâ; anfractibus, ultimo ventricoso cæteris rapidè diminutis; suturis bene signatis; aperturâ

ovatâ, intùs albidâ, fasciis quibusdam castaneis ornatâ; labro intùs denticulato.

This species resembles so closely the figure given in Griffith's Cuvier, Pl. 14, f. 3, as *Melania conica* of Gray, that I am unwilling to describe it as new, in the absence of a specific character of that shell. Gray's figure, however, does not exhibit the obsolete sulcations of the shell under review,—an omission which may be attributed to the brown incrustation with which they are ordinarily obscured, nor the smoothed denticulations which ornament the interior margin of the right lip in our shell. Should it eventually prove to be distinct, it may be named *M. denticulata* from this character, which is also possessed in a minor degree by *M. Stephanus*. The spire is eroded in all the specimens which I have examined. Length one inch.

34. *Neritina depressa*. Testâ solidâ, sub-convolutâ transversè ovatâ, gibbosâ, olivaceâ, longitudinaliter purpureo-fusco latè strigatâ, strigis versus apicem angulato-flexuosis; spirâ depressâ; anfractibus sub-binis; peritremate integro acuto, sub-orbiculari; septo calloso magno; aperturâ parvâ, lunatâ, aurantiâ; labio sub-recto, medio emarginato, ibi denticulato.

Greatest transverse diameter 0.8 inch. The peritreme which surrounds the aperture and shelving callus is nearly free, and occupies nearly the whole face of the shell. All within it, including the septum as well as the aperture, is usually of a dull orange colour. When *weathered* the shell is whitish, with pink bands and zig-zag lines; the denticulations of the inner lip are occasionally obsolete. The individuals in the Society's collection are probably from the *Sundarban* rivers, as the species is common, adhering to wooden piles and brick-work in the Húghlí at Calcutta, as well as in waters which have periodical communication with it. The following species is so nearly allied to *N. depressa* that I shall describe it here for the purpose of instituting a comparison and pointing out the distinctive characters, although no example of it occurs in the collection.

35. *Neritina cornucopia*. Testâ solidiusculâ, convolutâ, subsymmetricâ, transversè ovato-acutâ, gibbosâ, pallide virente, punctis minimis nigris, interdum confluentibus, lineis longitudinalibus dispositis ornatâ; sporâ valdè depressâ; anfractu pone callum compresso, sub-mediano, minimè obliquo; peritremate acuto, libero, ovato, pene totam testam circumcludente; callo magno ingrescente; aperturâ lunatâ mediocri; labio recto totâ longitudine denticulato, medio emarginato.

Greatest transverse breadth 0.7 inch. At the first glance this shell would probably be mistaken for the last described species, from

which it differs more especially in the greater proportionate size of the aperture, in the perfect parallelism of the inner lip with the axis of the shell, its denticulation nearly throughout its whole length, instead of merely in the centre; in the compression of the whorl at the back of the callus, and its subcentrical position, thereby occasioning the approach of the shell to a symmetrical configuration, and finally in its suite of colours. It is much less frequent than *N. depressa.* I have met with only two specimens, in the Húglí at Fort William, and in Tolly's Nullah, adhering to piles and bricks. The aperture is livid white, with blackish shades. The operculum, following the form of the aperture, is broader than in *N. depressa,* and its two costate teeth are more developed.

36. *Neritina tigrina.* Testâ globoso-conoideâ, corneâ vel olivaceâ, lineis subtilissimis, fasciis angulato-flexuosis, maculisque nigris longitudinaliter strigatâ; suturis obsoletis; anfractu ultimo ventricoso, infrà suturam excavato-depresso; aperturâ obliquâ, intùs albâ; callo columellari maculâ luteâ notato; labio medio emarginato, infrà projecto, emarginatione projecturâque ambabus denticulatis.

The specimens, in the collection, of this very handsome species are of an ordinary size. A fine individual which I took adhering to the piles which defend Fort William from the action of the Húglí, measures 1.35 inches in length. The operculum is very strong, and besides the two exserted mucrones at the lower part, have two strong radiating curved ribs on the inner surface, the central one of which forms, at its termination, a third mucro. In addition to the living examples which I met with in the River Húglí, I have a beautiful specimen which I captured in the aqueduct that supplies the old Course at Calcutta. When decorticated the ground of the shell is white; and the black markings assume a purplish hue.

Two other very distinct species of *Neritina* with oblique apertures inhabit the waters around Calcutta. I propose shortly to describe them as *N. retifera* and *N. obtusa.*

In all the species of *Neritina* of which I have seen the operculum, that accessory piece is smooth and polished, exhibiting only faint radiating striæ or striæ of growth; but in a ribbed *Nerita* which occurs at the embouchure of the Húglí, the exterior surface of the operculum is granulated like shagreen. Is this latter character permanent in the genus *Nerita?* if so, it will furnish an additional mark to distinguish the two genera.

37. *Navicella compressa.* Testâ transversè elongatâ, compressâ, luteâ, albidâ, vel corneâ, lineis munitissimis transversis diversè colo-

ratis, maculisque alternatis radiantibus decoloratis pictâ; dorso elevato; limbi extremitatibus emarginatis. Long. 0. 85, Lat. 0. 45 poll.

From the peculiar form of the aperture of this shell, it is evidently accustomed to adhere to the convex surfaces of cylindrical bodies of small diameter, probably the stems of shrubs growing in the water, to which the sinuous disk would exactly conform. The numerous specimens in the collection all possess the same feature, which is never observable in *Navicella tessellata* of LAMARCK. The last mentioned shell I discovered adhering in abundance to piles in the Húghlí river under Fort William, and more rarely attached to bricks in Tolly's Nullah. I have retained the name proposed for the new species by Dr. J. T. PEARSON.

ACEPHALA.

38. *Anodonta soleniformis.* Testâ elongatissimâ, posticè angustatâ, extremitate rotundatâ; anticè latiore, sub-alatâ, extremitate obliquè truncatâ: Natibus complanatis, inconspicuis, senectute obliteratis, decorticatis; epidermide junioris fulvidâ, præter angulum umbonis viridi, salcis illuc vinis impressâ, ætate fuscâ. Long. 6 poll. Lat. prope apicem 1. 2, Lat. prope alam 1.5 poll.

This is a very interesting shell, being, in proportion to its length, the most elongated of the genus. The pearl of the interior is bluish, with a salmon tinge in old specimens, which are likewise much worn on the exterior surface, and have their posterior muscular impression very deeply marked, and, as it were, carious. The anterior muscular impression is considerably elongated under the transverse direction. With the exception of a minute species which inhabits ponds in *Bundelkhand,* this is the only Anodonta hitherto met with in this Presidency.

39. *Unio cæruleus,* LEA. Trans. Amer. Phil. Socy. vol. 4.

A compressed variety of this shell occurs in the collection.

40. *Scaphula celox.* Testâ elongatâ, tumidâ, læviusculâ, anticè angulatâ, inter umbonem extremitatemque anticam subito evasâ; carino umbonali compresso, costulâ obsoletâ contiguâ.

Scaphula: BENSON, Zoological Journal, Vol. 5, page 464-5, and Gleanings in Science, Vol. 1, Plate VII, fig. 2 and 3.

One or two examples of this rare fluviatile genus of Arcacea which I first discovered in the Jumna, and subsequently met with in the river Cane, occur among the shells brought from the Eastern frontier.

IX.—*Note on Zoological Nomenclature. By* B. H. Hodgson, *Esq.*

If I revert to the comments of your anonymous correspondent upon my *Cervus Elaphoïdes*, (No. 52 for April,) it is because I think that a question of some moment hangs upon the judgment pronounced in this case, viz. the right to designate species, and the consequence of doing so from very imperfect knowledge.

According to your correspondent's own shewing, Cuvier never procured more than the horns of this deer; and, so conscious was Cuvier, ultimately, of his inability to fix the species upon a just basis, that, in his last edition of the Regne*, all mention of it is omitted. Meanwhile, however, he gave it a name, upon retaining which your correspondent insists, although your correspondent, in the very same page, exhibits the following practical consequence of such proceedings.

The first writer of the age upon the tribe of animals to which our *Cervus* belongs (H. Smith) is entirely *misled* by Cuvier's insufficient definition, or rather designation, and ascribes this deer to the *Rusa* group! Now, it is a well known fact, that, although the more skilful general writers upon zoology have, of late years, omitted half the recorded species from inability to verify them, yet that, amongst the species inserted, no careful student can satisfactorily refer to one in ten! Is this system to go on? and, if not, is there any cure for it but a general resolution to admit no names of species which the nomenclator has not, at the time, *or subsequently*, verified?

Your correspondent has only to turn to those recent and costly works upon Indian Zoology, Gould's Century and Hardwicke's Illustrations, and he will find that the multiplication of idle names and of fictitious species is still going on, under the auspices of persons who neither have, *nor can have*, competent means of at once undoing past errors and preventing future ones. Press or picture, it is the same thing. Neither ought to be devoted, in permanent style, to the propagation of delusion and inconvenience; nor any ad interim labours of any man recognised, (except such as he has ultimately himself completed), if their recognition have that effect, at the same ime that it interferes with the just reward of the ripe and adequate labours of others. *Finis coronat opus:* and, though it may be reasonable to admit temporarily all names, as an index and stimulus to discovery, as well as to sustain eventual claims, if advanced, yet those names alone are entitled to permanence which the affixers, sooner or later, connect with indisputable species. Cuvier himself

* A new and amended list of all authentic species is given in this edition.

abandoned his name, because he could not eventually so connect it: and I confess I do not perceive upon what sound principle your correspondent insists upon the revival and retention of that name.

I beg to acknowledge the courtesy of your own note appended to the communication in question, and to state my conviction that Du Vaucel most probably obtained the horns of the Cervus Elaphoïdes from me.

The observation of your correspondent—that the "suborbitar depression on the skull of our deer is perforated by a very large oval hole, which is not found in the skull of the *Jaraï*"—wants, I believe, confirmation. Such holes are very usually found in the skulls of both species; but, so far as my experience goes, they are not proper to the *perfect* skull of either*. After considerable inquiry amongst my friends to the westward, I have determined to retain the name of *Bara Sinha* for the *Cervus Elaphus*; those of *Maha* and *Bahraiya* for *Cervus Elaphoïdes*; and that of *Jaraï* for the only type of the *Rusa* group known to me. This animal is the *Cervus Jaraï* of Hodgson, precisely *because* he has found it utterly impossible to fix the shifting and insufficient specific indications of H. Smith—a difficulty, by the way, which your correspondent seems to share, if I may judge by his somewhat loose allusion to "*Cervus Hippelaphus and Aristotelis* or *Rusas*" (in the plural.) May I hope for his valuable assistance in my endeavours to decide, whether there be really *more than one* species of *Rusa* in the Bengal Presidency? and *which* of the *several* named by H. Smith it or they be? Let me request your correspondent to test the above remarks on nomenclature by applying them to the very difficulty just cited. I am content to abide by the issue!

[We have to apologize for so long delaying the publication of Mr. Hodgson's note, which has been lying in type at the printer's some months. We are very sure the correspondent to whom he appeals will assist in the desirable object of identifying and fixing Indian Species.—Ed.]

* If they *were*, we should be in the way of ascertaining the probable or possible truth of that startling assertion, that breathing takes place through the suborbital sinus. I have examined repeatedly fresh heads of several species with a view to this assertion: and my conclusion is that it *cannot* be true, unless breath can pass through bone and skin too: for, in the perfect skull there is no solution of continuity in either substance, within the limits of this sinus. *Without* and *above* the sinus, there is something extremely like such a solution, in the sculls of Elaphus, Ratwa, Jaraï and Elaphoïdes. But, even here, a *perfectly fresh* head will exhibit osseous or quasi osseous continuity; and the skin-fold is ever uninterruptedly carried through the sinus, though with much attenuation at the bottom of it.

X.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 7th December, 1836.

The Honorable Sir Edward Ryan, President, in the chair.

H. Walter, Esq. C. S., Principal Bramley, Dr. James Drummond, Nawab Tahawur Jung Behadúr, Sháh Qabir u'di'n, and Dr. R. A. Jackson, proposed at the last meeting, were balloted for, and duly elected Members of the Society.

Mr. W. Dent was proposed by Mr. H. T. Prinsep, seconded by the Secretary.

Mr. Manuk, proposed by Dr. Stewart, seconded by Mr. Baillie.

Babu Herambana'th Thakur was appointed to officiate as Collector to the Society, during the absence of Babu Ram Comul Sen, on a visit to the Upper Provinces.

The following reply from Government regarding the *Alif Leila* was read:

To James Prinsep, Esq.

Genl. Dept. *Secretary to the Asiatic Society.*

Sir,

I am directed to acknowledge the receipt of your letter, dated the 7th ultimo, relative to the proposition of Mr. C. Brownlow, to publish at his own private risk a complete edition of the Ulif Leila, or Arabian Nights' Entertainments, in the original Arabic, from a very complete manuscript purchased by him from the estate of the late Major Macan, and requesting the same support to this work as has usually been accorded both by the local Governments, and by the Honorable Court of Directors to literary undertakings of a similar description.

2. In reply, I am directed to state that in compliance with the recommendation of the Asiatic Society, and in consideration of the manner in which the publication of this work has been undertaken, and of the credit that will attach to its completion in the manner proposed, his Lordship has been induced to subscribe for fifty copies at the price stated, viz. 48 rupees per copy.

3. The copies when printed will be appropriated for distribution as prizes in the Seminaries of Education at which the study of Arabic is cultivated, with the reservation of such number as the Governor of Bengal may present to the Public Libraries and Institutions of Europe or of this country. Mr. Brownlow may be desired to deliver the fifty copies at this office, where his bill for them will be discharged.

4. But the Right Honorable the Governor of Bengal cannot close the reply to this reference from the Asiatic Society, without expressing a strong desire to learn that the translation of the complete work is likely to be undertaken by some competent scholar of this Presidency. His Lordship will be glad to be informed of any scheme for procuring the accomplishment of this desirable object, that the Asiatic Society may be able to suggest and think deserving of encouragement.

I have the honor to be,
Sir,
Your most obedient servant,
H. T. Prinsep,
Secy. to Govt.

Fort William, the 2nd Nov. 1836.

Resolved, that a copy of the reply be transmitted to Mr. C. Brownlow, the publisher of the work in question.

It was intimated that a gentleman in the Civil Service, eminently qualified for the task, had volunteered to make an English translation of the portions of the "Nights' Entertainments" as yet unedited.

The following letter from the Asiatic Society of Paris, brought out by the Chevalier General ALLARD, was also read:

Société Asiatique, Paris, le 1 *Mars*, 1836.

Messieurs;

Les encouragemens que le Gouvernement Anglais dans l'Inde a accordés presque en tout temps à la publication des ouvrages classiques dans les langues savantes de l'orient ont toujours été regardés en Europe, comme un de ses plus beaux titres de gloire. Ces publications ont puissamment aidé au développement que les études historiques et philologiques ont pris depuis le commencement de ce siecle, et elles ont servi a répandre le gout des lettres orientales. Ainsi les ouvrages classiques publiés par le Comité d'Instruction publique de Calcutta, quoique destinés immédiatement aux écoles Indiennes ont rendu aux écoles de l'Europe les plus grands services. Ils ont commencé á remédier á la rareté des manuscrits sanscrits en Europe, et ont facilité l'étude d'une littérature dont l'importance pour l'histoire de l'esprit humain n'a pas cessé de s'accroître.

Le Comité avait donné, dans les derniers temps, l'espoir que l'on verrait encore s'aggrandir le cercle de ses entreprises. Il avait annoncé que le Mahâbhârat, le Rája Tarangini et plusieurs autres ouvrages de la plus haute importance, étaient sous presse, et qu'il préparait des materiaux pour une édition des Vedas et des livres sacrés des Bouddhistes. Ces annonces ont été reçues en Europe avec un intérêt marqué, et les savans ont suivi avec une grande sollicitude les progrés de ces ouvrages. Mais on a appris derniérement, que le Gouvernement du Bengale a cru devoir suspendre toutes les impressions en langues Orientales, et destine les fonds qui devaient y pourvoir, à un but différent.

Il n'appartient pas á une Société littéraire de juger des raisons politiques ou financières d'un gouvernement étranger, mais la Société Asiatique croit pouvoir exprimer ses regrets qu'on ait abandonné des entreprises qui auraient servi les intérets de la science, et qui auraient honoré la nation qui les avaient commencées. Aussi, a-t-elle sincèrement applaudi à la détermination que vous avez annoncée, Messieurs, de reprendre la publication de ces ouvrages, et elle désire vivement pouvoir vous aider dans l'accomplissement de votre plan. Elle vous offre en conséquence de servir d'intermédiaire entre vous et les Savans du Continent. Elle espére pouvoir trouver un nombre plus ou moins considérable de souscripteurs aux différent ouvrages que vous avez l'intention de faire paraître.

Si vous agréez ce plan, elle vous prie de lui communiquer la liste des ouvrages à publier, et les prix approximatifs de chacun. La Société redigerait alors un programme et une circulaire, pour faire appel á ses membres et aux divers corps savans, a fin d'exciter autant que possible l'intérét du public pour les importantes publications de la Société.

It est impossible d'apprécier d'avance le resultat de cette démarche, mais la Société croit ne faire que son devoir en donnant aux savants Européens les moyens de s'associer á votre généreuse entreprise.

Nous avons l'honneur de vous offrir, Messieurs, l'assurance de notre haute considération.

P. AMIDEI JAUBERT, *Président de la Société.*

EUG. BURNOUF, *Secrétairé de la Société.*

Resolved, that an appropriate reply be returned in the same form to the Asiatic Society of Paris, accepting with pride and satisfaction its generous offer of aid in promoting the completion of the abandoned oriental works, and of acting as the channel of their circulation and sale on the continent of Europe.

A letter from Major TROYER, tendered, in the same spirit, his service as agent to the Society at Paris, and acknowledged receipt of presentation copies of Sanscrit works.

Extracts of letters from Messrs. BURNOUF, JACQUET, and Professor LASSEN, connected with the same topic, were read; also from Messrs. CAS-

SIN, agent and bookseller to the Paris Society, suggesting arrangements regarding the prices of the several works.

A letter from M. ROUY DE ROCHELLE, President of the Geographical Society of Paris, stated that a resolution of the Society had determined to present the Asiatic Society with a complete series of their Bulletin, anterior to the period when its relations with Calcutta had commenced.

Resolved, that the compliment be returned by presenting a copy of such former volumes of the Researches as are in store.

A letter from Mr. EDWARD THOMAS, C. S. at Almorah, presented three manuscript volumes in short-hand of the late Mr. LAIDLAY.

They appear to be private note books, and memoranda of the author's reading—not in the common form of stenography, and therefore illegible.

Dr. D. STEWART presented copies of the Proceedings of the Statistical Society of London for 1835-36, and series of questions and forms for circulation, with a view of extending its information on subjects connected with the science.

The PRESIDENT founded upon these documents, a motion for the formation of a Committee in the Society, which should direct its exclusive attention to the Statistics of India, both by inviting returns to circulars modified to suit the circumstances of the country, and by searching, with permission, the records of Government.

Mr. H. T. PRINSEP urged that the magnitude of the object was beyond the power of a Committee ; the Government had at one time expressly commenced such a record, and had given it up after spending a lakh and a half of rupees on three small districts.

Dr. STEWART thought that the materials collected might be examined and abstracted by the Committee, and, without aiming at minute detail, much useful information might be obtained on the population and mortality, for instance, of the principal towns. He had himself lately roughly estimated the mortality of Calcutta, and was appalled at finding it 1 in 26, the highest rate almost on record. After some discussion it was

Resolved, that a Statistical Committee be formed, consisting of Sir B. MALKIN, Mr. J. G. GORDON, Mr. W. ADAM, Mr. BAILLIE, and Dr. D. STEWART, the latter gentleman kindly undertaking the duties of Secretary.

Library.

The following books were presented.

The Archaelogia, or Transactions of the Antiquarian Society of London—*by the Society.*

Transactions of the Geological Society of London, vol. iii. part 3, and vol. iv. part 1—*by the Society.*

Journal of the Royal Asiatic Society of London, No. 5—*by the Society.*

Proceedings of the Geological Society of London, Nos. 40, 41, 42, 43, 44, and 45—*by the Society.*

Sir PHILLIP GREY EGERTON'S Catalogue of Fossil fish in his own and Lord COLE'S Collection—*by the Author.*

Address delivered at the Anniversary Meeting of the Geological Society of London, on the 19th February, 1836, by CHARLES LYELL, M. A., F. R. S. President of the Society—*by the Society.*

Memoires de la Société de Physique et D'Histoire Naturelle de Genève, tome vii. pt. 1—*by the Society.*

Two Tibetan block-books, religious tracts, entitled *Smon-lam-btschu-tham-ab-yorbai-smon-bsngo-ba ;* and *Bchom-ldan-hdas-ma-sches-rab-kyi-pha-rol-tu-phy-inpai-sning-po ;* printed at Leipsig—*by M. Jacquet.*

Glagolita Clozianus ; Codicis Glagolitici Antiquissimi, Leipsanon folioriom servatum in Bibliotheca Paradis Cloz Tridentini, by *Bart. Kopitar*, Curator of the Imperial Library at Vienna—*presented by the Author.*

Gefchichte der Osmanifshen Dichtlunft—*by the Baron Von Hammer-Purg-ſtall.*

Lectures on Comparative Anatomy, by Dr. ROBERT E. GRANT—*by the Author.*

Bulletin de la Société de Geographie, vol. i. iii. iv. to x. and xvi. to xx. of the first series ; and vol. iii. iv. of the second series—*by the Society.*

Abrégé du Roman Hindustani intitulé La Rose de Bakawali, par M. GARCIN DE TASSY—*by the Translator.*

Mode d'Expression Symbolique des Nombres employés par les Indiens, les Tibetains et les Javanais—*by M. Jacquet.*

Journal Asiatique, Nos. 90, 91, 92, 93, 94, 95, and 96, for 1835, and Nos. 1, 2, and 3, of the New Series for 1836—*by the Asiatic Society of Paris.*

Madras Journal of Literature and Science, No. 13—*by the Madras Literary Society.*

The Indian Journal of Medical Science and Scientific Review, No. 12—*by Dr. F. Corbyn, the Editor.*

A copy of the Old Testament, translated into the Burmese language, by the Rev. A. JUDSON—*through Rev. Howard Malcom.*

GAY'S Fables, translated into Urdú Poetry, by Raja KALIKISSEN Behadur—*the Translator.*

" Mashtoz," or the Ritual of the Armenian Church ; in two volumes, printed in Calcutta, and *presented by the Editor, Mr. Avdall.*

The Meteorogical Register for October 1836—*by the Surveyor General.*

The following books, selected by Professor WILSON, were received from the Booksellers :

Eichhoff Parallele des langues de L'Inde. Paris, 1836, royal 4to.

Freytag's Hamasæ Carmina, 4to. (in Arabic.)

Amrulkeisi Moallakah, Arab. et Lat, ed. J. A. HENGSTENBERG, Bonn, 1823.

Kosegarten, Amrui ben Kelthum Taglebitae Moallakam Abn Abdallae, 4to.

Humbert, Arabica Chrestomathia Facilior, 8vo.

Rosenmuller, Institutiones ad Fundamenta Linguæ Arabicæ, 4to.

Bernstein, Hetapadaesi particula, edidit et Glossar. Sanscrit, 4to.

Wustenfuld, Abulfedæ Tabulæ quædam, &c. 8vo. Gott. 1835.

Flugel, Corani Textus Arabicus ad fidem lib. MSS. 4to. calf and lettered.

PETTIGREW'S Egyptian Mummies, 4to. ditto.

GUTZLAFF'S Voyage to China, post 8vo. ditto.

AUBER'S British Intercourse with China, 8vo. ditto.

DE LA BECHE'S Geological Manual, 8vo. ditte.

MCCULLOCH'S Commercial Dictionary, 8vo. ditto.

Moor's Oriental Fragments, post 8vo. ditto.
Wight and Arnott's Prodromus, 1 vol. 8vo. ditto.
Gutzlaff's History of China, 2 vols. 8vo. ditto.
Bennett's Wanderings in New South Wales, 2 vols. 8vo. ditto.
Smith and Dwight's Missionary Researches in Armenia, 8vo. ditto.
Robert's Illustrations of Sacred Scriptures, 8vo. ditto.
Wilkinson's Topography of Thebes, &c. 8vo. ditto.
Breton's Scandinavian Sketches, 8vo. ditto.
Hoskin's Travels in Ethiopia, 4to. ditto.
Robert's Scenes &c. of Hindoostan, 3 vols. post 8vo. ditto.
Wellesley's Dispatches, vol. 1. ditto.
Malcolm's Memoir of Lord Clive, 3 vols. 8vo. ditto.
Laborde's Mount Sinai and Petra, 8vo. ditto.
Carey's Memoir of Dr. Carey, 8vo. ditto.
Rich's Koordistan and Nineveh, 2 vols. 8vo. ditto.
Edinburgh Cabinet Library—China, 3 vols. 12mo. ditto.
Abeel's Residence in China, 12mo. ditto.
Nala and Damayantí, by Milman, imperial 8vo. ditto.
Akermann's Catalogue of Roman Coins, 2 vols. 8vo. ditto.
Madox's Excursion in the Holy Land, 2 vols. 8vo. ditto.
Lang's History of New South Wales, 2 vols. post 8vo. ditto.
Seale's Geognosy of the Island of St. Helena, folio, cloth.
Wight's Contributions to the Botany of India, 8vo. calf and lettered.
Davis's Chinese, 2 vols. post 8vo. ditto.

Antiquities and Literature.

Mr. Walter Ewer, in a note, adverted to Mr. Traill's drawing, of the *Garhwal* tridents.

The proportions of the trident of *Barahát* are incorrectly large for the staff, (see Plate XXIX.)—the edge of the axe should be at right angles to the trident, and consequently not visible laterally on the sketch:—the letters of the inscription also do not project from the surface, but are indented. The words are sufficiently correct.

Lieut. Barton, on his departure for Europe, begged the Society's acceptance of a copy in manuscript of Bahadin's Life of Saladin; also of Napoleon's acount of the Campaign of 1805, printed in Arabic at Alexandria.

Captain Jenkins forwarded a copy of the Ahom alphabet, compared with the Bor Khamti, Shyán, Laos, and Burmese, with explanatory notes by Rev. N. Brown.

This alphabet has been a desideratum for some time, and as very few indeed of the inhabitants of Assam are now acquainted with this extinct character, preserved chiefly on the coins of the indigenous rájas, an opportunity had been sought in vain for recovering it, until Mr. Brown's residence and study brought him in communication with some pandits who have given the desired information. We hope to publish it in our January number.

Mr. J. G. Heatly submitted a second paper on Analytic Geometry.

Physical.

Geological specimens from Kemaon, with a descriptive catalogue.—

Also, a list of the rock specimens from the Kasiya range and Assam, formerly deposited in the Museum, presented by Dr. McClelland.

A fine series of butterflies, moths, and insects from Sagur was presented by the Secretary, being part of a rich collection forwarded to him by Major Hearsey, Commanding 2nd Local Horse.

Volcanic ashes picked up at sea by Captain Fergusson, of the ship *Henry Tanner,* presented by Mr. T. L. Henley.

"The position in which these ashes were picked up was 35 miles South lat. and 15° 50′ west long. The sea was in violent agitation.

On a former voyage by the same commander, in nearly the same place (lat. 1° 35′ S. and long. 20° 45′) much alarm was created on board by a violent rumbling noise, the captain and officers believing the ship to have struck and grating over a coral reef: no bottom, however, was found on sounding.

In the same latitude and about a degree more easterly, there is a shoal laid bearing the name of some vessel, but considered doubtful."

The ashes are black, and resemble cinders or pumice in consistence.

A collection of lichens from the Himálaya Mountains, was presented for the Museum, by Mrs. Siddons.

A specimen of Adjutant, *(Ciconia Argala,)* presented by Dr. O'Shaughnessy, and mounted in the Museum.

A specimen of the Modern Crane of Latham, purchased and mounted in the Museum.

Note.—The latter of the above specimens is generally considered as the young bird of the former, although Latham thinks it a distinct species. The attention of observers is requested to the point.

A skeleton of the Hindústání Bullock, presented by Captain Cartwright, and articulated in the Museum.

A ditto ditto, presented by Major Tennant.

A stuffed specimen of Albatros, *(Diomedea exulans,)* presented by Mr. J. W. Linton of Howrah.

A specimen of the Nípal Musk Deer, and of the *Ailurus Fulgens* or "Wah" of the Bhotiahs, by Dr. A. Campbell, of Katmandhú.

Papers Communicated.

Notice of Balantium, a genus of Pteropodous Mollusca inhabiting the Southern Indian Ocean, by W. H. Benson, Esq.

Notice of the Musk deer of Nípál, taken at a postmortem examination, by Dr. A. Campbell.

Observations on the anatomy of the plants of the order Hepaticæ, accompanied with a series of beautiful Iconographic drawings of specimens of the three sections. *Jangermannia, Marchantia,* and *Riccioideæ,* by Dr. Wm. Griffiths, Assam.

Remarks on the Silk-worms and silks of Assam, with specimens of the moth, worm, chrysalis, cocoon and silk, by Mr. Thomas Hugon, illustrated with drawings by Mr. Hudson, Deputy Revenue Surveyor, were forwarded by Major Jenkins, Governor General's Agent in Assam.

Having been placed in the hands of Dr. J. H. Helfer for arrangement and examination, that gentleman read at the close of the Meeting a paper on the indigenous silk-worms of India.

Dr. HELFER commenced by a series of observations on the importance of silk as an article of wearing apparel throughout the globe. He stated that the discovery of India and China was valuable to the ancient Greeks and Romans, chiefly on account of the precious web of the Bombykia, called *Se* or *Ser*, whence the newly discovered countries derived their name of *Serira*. JUSTINIAN, said Dr. H., obtained an insight into the secret of its manufacture from two Persian monks, the first silk being fabricated at *Byzantium*. Dr. HELFER followed up his subject by stating, that the Sicilians in the time of ROGER I. became wealthy by the introduction of silk into *Palermo*,—that the Venetians acquired riches by the trade of silk with the Levant, and that in our days it is an unlimited source of income to countries cultivating it on a large scale. France alone exported in the year 1820, 130 millions of francs worth of silk, and England consumes annually 4,700,000 pounds, for which it is chiefly indebted to foreign countries.

Dr. HELFER considers India particularly suited for the cultivation of silk, and deems it very interesting and important, that this country possesses already eleven known different kinds of silk-worms, producing in abundance silk of different qualities, and having by this the internal means of providing all Europe with this precious material. He enumerated the eleven different species, of which seven (though silk from them has been manufactured), never have been mentioned before. (The subject was illustrated by the exposition of all the different qualities of silk, the preserved moths, cocoons, chrysalis, and eggs.) Two of the silk-worm species, the Tusseh and Arrindy, were known in India, and their silk was considered singular enough in Europe, and regarded as inferior qulity of the mulberry silk-worm,—though Dr. ROXBURGH and Dr. BUCHANAN, had long ago published an account of them, which Dr. H. quoted. Two different species were discovered by Dr. H.; four others were mentioned as problematic, and three other new species sent from *Assam* by Capt. JENKINS, accompanied by a very interesting memorandum. Dr. H. deems those sent from *Assam* exceedingly valuable, as the cocoons which they produce are considered by Mr. W. PRINSEP, exceedingly fine.

Dr. HELFER then, after giving a systematic description of all the new species, went into the question as to whether the silk of India is naturally inferior to that of other countries. He regards the question as undecided, and considers that every thing must depend upon the rearing of the worm in houses—upon the quality of their food—upon the first chrysalic operations—and upon the manner of working the silk. He proposed that all moths producing cocoons—which, judging by analogy, he computed at upwards of 130 kinds in India,—should be examined, and specimens of raw and wrought silk sent to Europe; and he thinks it certain, that, by the manufacture of silk on a large scale, a vast revenue will accrue to this country. He referred to the value set in Europe upon the coarsest material produced by the Arrindy silk worm. The Doctor concluded his very interesting discourse by narrating a fact communicated by Dr. GLASS of *Boglipur*. It appeared that Dr. G. had sent specimens of the silk to England: when it was shewn to the different manufacturers they answered, that the people in India had been deceiving them by stating that the fine Cashmere shawls are manufactured from the wool of the goat: it was plain to them that the shawls were composed of the silk, and they said, that, with *that* material, they, the English manufacturers, could make better shawls than any which came from India.

The President, on behalf of the Society, acknowledged their obligations to Dr. HELFER for his interesting paper.

(We shall hasten to print it when the drawings of Mr. HUDSON can be engraved.)

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of November, 1836.

Day of the Month.	Observations at 10 A. M.							Calculated Humidity.			Observations at 4 P. M.							Calculated Humidity.			Register Thermometer Extremes.		Rain.	Wind.		Weather.	
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew point.	Hair Hygrometer.	Centesimal tens. of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	New Standard Barometer.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew-point.	Hair Hygrometer.	Centesimal tension of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	Cold on roof	Heat in sun.		10 A. M.	4 P. M.	Morning.	Evening.
1	29,856	,898	80,7	4,1	3,9	70,2		80	72		29,764	,802	76,3	2,3	3,3	71,0		87	84		71,7	91,7		e.	S. W.	cloudy.	showery.
2	,773	,806	78,7	3,1	3,0	70,3		85	77		,647	,655	83,5	6,7	6,3	68.8		70	62		67,5	95,4		W.	nw.	do	clear.
3	,769	,802	80,5	3,2	3,0	72,5		85	77		,679	,725	81,1	7,7	7,5	66,5		67	62		72,2	91,0		S.W.	S. W.	do	cloudy.
4	,887	,922	79,0	7,4	7,0	67,0		66	68		,772	,820	84,7	9,2	8,9	63.5		62	51		66,4	111,0		ne.	nw.	cir. cumulus.	fine.
5	,932	,971	80,9	9,1	9,7	58,8		68	44		,832	,884	84,4	16,6	14,8	56,6		35	49		65,8	106,8		N.W.	N.	fine.	clear.
6	,944	,979	76,1	7,2	7,5	62,0	82,0	65	63		,800	,860	83,5	14,6	14,4			40			59,8	103,0		N.	nw.	clear.	do
7	,906	,948	79,6	10,9	10,8			52			,803	,865	84,4	13,6	14,2			45			60,8	102,5		N.	nw.	do	do
8	,980	,020	79,1	8,3	8,4	62,2	79,0	62	58		,847	,912	83,7	14,5	14,7			40			58,8	110,6		E.	w.	hazy.	do
9	,962	,992	77,9	7,1	7,3	64,0	83,0	62	64		,787	,904	81,1	12,7	11,5	60,0	73,0	45	50		59,3	110,6		w.	ne.	clear.	do
10	,902	,947	77,1	6,9	6,7	64,0		67	66		,765	,831	81,9	13,1	12,1	60,5		45	50		60,8	104,5		n.	n.	do	do
11	,838	,923	78,7	9,8	10,5	60,5	76,	55	58		,771	,826	81,7	12,4	11,7		74,0	46			62,3	105,6		o.	nnw.	cumuli.	cumuli.
12	,927	,969	78,3	9,0	9,7		77,	60			,830	,888	82,1	12,7	12,7	58,0		49	46		60,0	102,8		ne.	S. E.	fine.	clear.
13	,988	,035	78,4	9,2	9,0	63,0	80,	57	61		,880	,946	82,6	12,2	11,3	61,5	74,0	49	51		62,1	105,2		n.	ne.	do	do
14	,009	,056	79,3	9,5	10,0	63,2	79,	57	59		,887	,940	82,5	12,5	10,8	62,0	74,0	49	57		63,8	111,7		n.	o.	do	do
15	,987	,030	78,5	10,1	10,5	60,3	75,	52	55		,843	,897	80,9	13,4	12,5	56,1	73,0	42	44		59,0	98,7		ne.	w.	do	do
16	,948	,977	77,1	8,9	8,6	60,7	81,	57	58		,813	,868	80,9	13,4	12,8	55,0	72,0	42	43		58,5	94,8		n.	nw.	do	do
17	,914	,945	77,5	9,1	8,6	60,0	80,	57	56		,806	,879	80,2	13,7	12,5	58,0	72,0	42	49		57,8	97,5		n.	ne.	do	do
18	,926	,961	76,7	8,4	8,6	60,0	80,	60	58		,823	,890	81,0	13,7	13,0	59,0	71,0	42	49		58,2	102,0		n.	n.	do	do
19	,941	,978	75,1	6,7	6,8	59,8	83,	67	61		,797	,856	80,7	13,4	12,3		71,0	42			57,3	107,8		n.	n.	clear.	do
20	,923	,965	75,7	7,0	7,0	60,5	83,	65	61		,767	,830	79,8	12,6	11,5	58,5	74,0	45	50		59,2	105,8		nw.	n.	do	do
21	,889	,945	76,7	9,5	10,0	56,3	79,	55	52		,758	,828	79,1	11,3	10,6	56,6	73,0	50	48		59,8	116,5		W.	nw.	do	hazy.
22	,902	,950	75,0	7,7	7,2	60,5	74,	62	62		,785	,856	79,7	11,4	11,0	56,0	72,0	50	46		61,5	95,0		n.	se.	cloudy.	cloudy.
23	,860	,902	74,8	6,2	6,0	64,8		70	72		,729	,788	78,6	10,0	9,1	59,0	74,0	55	53		64,1	85,0		ne.	ne.	do	do
24	,856	,903	74,9	8,3	8,0	58,8		60	77		,733	,793	78,1	8,8	8,0	59,0		60	54		62,6	85,0		ne.	ne.	do	do
25	,872	,906	72,2	9,5	9,4	59,0		52	65		,747	,801	78,7	12,9	11,9	57,2	72,0	42	50		57,4	89,0		n.	ne.	overcast.	fine.
26	,908	,942	70,7	13,1	13,0			35			,791	,850	72,3	75,9	17,2	49,0	75,0	25	46		53,9	88,0		nw.	n.	clear.	clear.
27	,993	,041	68,3	11,3	11,7	45,3	71,	40	55		,879	,940	75,4	14,9	12,8		66,0	32			50,0	93,0		n.	nw.	do	do
28	,029	,068	71,0	11,3	11,3		73,	42			,856	,956	76,2	12,9	12,0		71,0	40			53,2	94,0		n.	n.	do	do
29	,025	,067	71,3	7,0	7,0	54,8	77,	62	61		,896	,958	77,0	11,0	10,4	46,6	73,0	50	36		52,2	94,0		nw.	nw.	do	do
30	,038	,080	71,7	7,9	7,4	55,5	72,	60	59		,915	,966	77,1	11,7	10,6	47,2	72,0	47	37		56,0	92,0		N.	N.	do	do
Mean,	29,928	,964	76,3	8,2	8,2	61,3		60	62		29,795	,862	80,3	12,0	11,4	58,5		47	50		59,0	99,8	0,18	light northly.		dry fine weather.	

New Standard Barometer lower than old at 10 A. M. 0,036 and at 4 P. M. 0,067 inch. Captain Henning of the Windsor has obligingly afforded me another opportunity of comparison with the Royal Society's Standard Barometer, by his new and excellent marine Barometer which had been found to stand too low on a mean of 5 observations, 0,028 (at 32°.) the same stood higher than my old standard at 10 A. M. 0.003 and at 4 P. M. lower 0.009 ; making my old standard lower than the Royal Society's instrument 0,020. No correction is applied for capillarity. My new Standard stands in like manner too low, at 10 A. M. 0.063, at 4 P. M. 082 inch. The hair hygrometer this month was unfortunately broken.

Fig 1



Fig 2



Fig: 3.

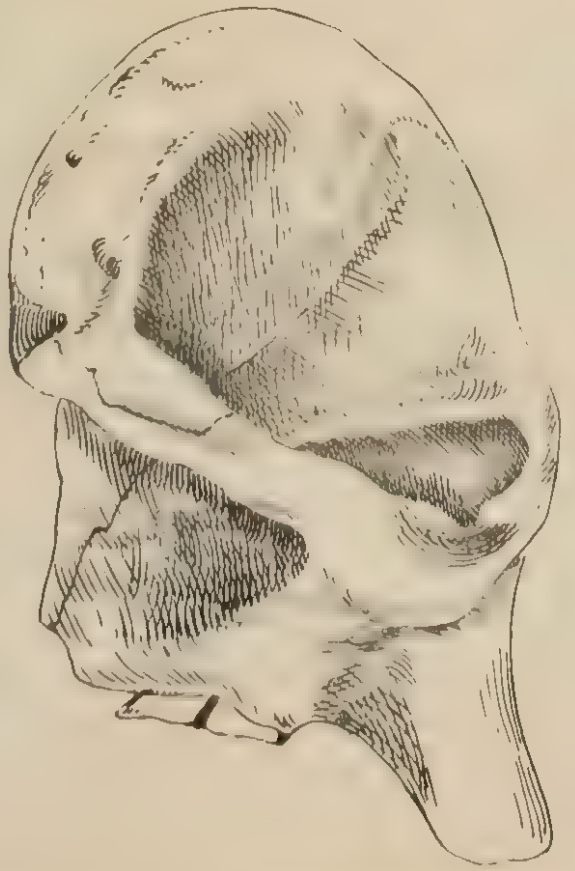
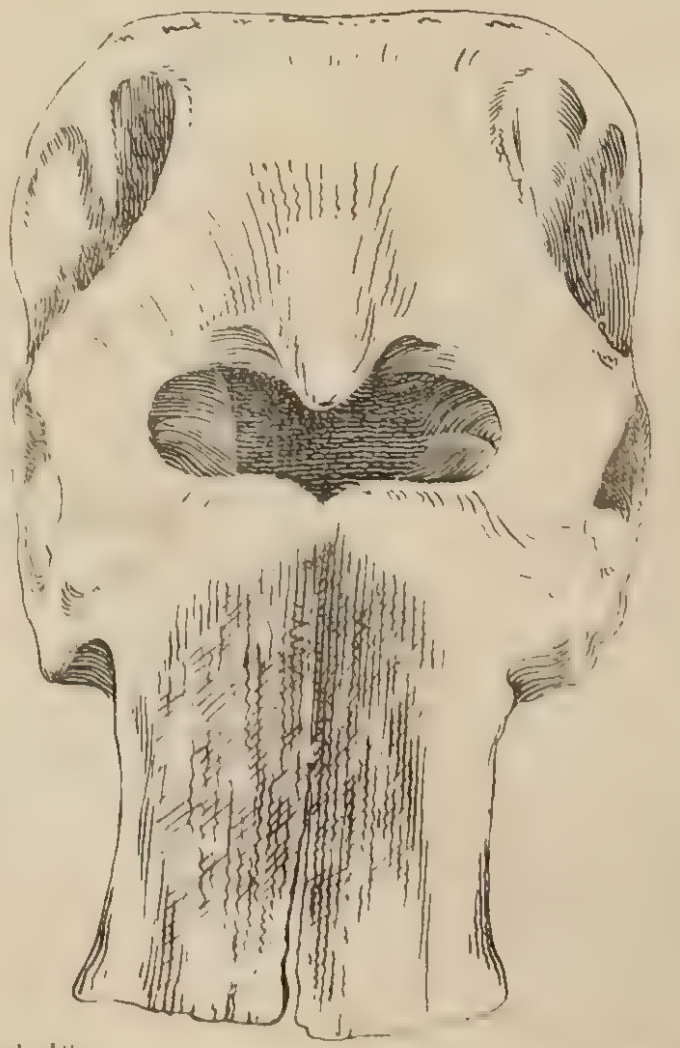


Fig: 4.



P. T. Cautley lithog

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I.—*Geological Notes on the Northern Conkan, and a small portion of Guzerat and Kattywár. By* Charles Lush, *M. D.*

[Communicated by the Medical and Physical Society of Bombay.]

In a paper which recently appeared in the Journal of the Asiatic Society of Bengal by Dr. Benza, on the Geology of the Nilgherry hills, it is remarked that "the elevation of this plateau, and probably the whole chain of the Western Ghats, of which the Nilgherries are the southern termination, happened at a period long anterior to the existence of life on our planet."

This appears, at first sight, a bold and sweeping conclusion: but I apprehend that those who have travelled in the *Dekhan*, the *Southern Conkan*, and that part of the *Carnatic* termed with us "*Southern Maratha country*," will not only be ready to concur in this opinion, but perhaps to extend it so far as to doubt the existence of any formation containing fossil remains in any part of Western India to the southward of *Cutch*.

In that province, it has been stated that oolite occurs. I believe, however, that no sufficient investigation has been made into this fact, to entitle us to assume the identity of such shell-stone with the recognized oolitic formations of other countries, so as to satisfy the rigorous views of a modern geologist.

There is a new era in geology. It is now in the power of any person who travels through countries where "the crust of the globe is untouched by the hammer of the geologist," to contribute to the advancement of this, the youngest of the sciences. By avoiding

speculations, not even giving a name to that which is found,—by carefully noting the site of specimens collected, according to the directions published by the Geological Society of London,—by forwarding collections to those persons who are best capable of comparing and identifying fossil remains,—materials will gradually be formed for a geological map of India, as well as for the development of sound doctrine regarding the mode and date of deposits. Let the traveller who goes northward over the plateau of the *Dekhan*, or who follows up the coast of the *Conkan*, conclude with Dr. Benza that the primary, the trap and the laterite rocks—nay, even the alluvial covering these, are antecedent to the existence of animal life on our planet. But, on finding in parts of the *Southern Conkan*, and especially in the island of *Bombay*, horizontal strata of sandstone containing shells, it would be well to look with more suspicion to the northward, and to be prepared to doubt the non-fossiliferous character of the rocks. The shell-stone of *Bombay* will, I hope, be investigated agreeably to modern rules, and materials furnished to those who are capable of deciding whether any, or what proportion of the shells belong to extinct species. It is easy to name this stone "coral rag," and it would cost no labour to speculate upon its being simply a deposit actually going on at the bottom of the *Bombay* harbour; a deposit here and there brought to light in consequence of portions of the present island having been gained from the sea since the place became a settlement. This question can only be determined in one mode;—by the examination and comparison of a few hundreds of species of shells. Decide then whether all are existing, or part extinct. Leaving this important matter for the investigation of some persons at the Presidency, I proceed to copy a few notes collected in a tour through the *Northern Conkan*, part of *Guzerat*, and *Kattywár*.

The most remarkable geological feature in the *Northern Conkan* between *Bassein* and *Surat*, is the extensive degradation and partial reproduction of land at different periods. Occasionally, denuded-strata are met with, the date of which can alone be determined by the nature of their organic remains. The first place at which I remarked strata of sandstone similar to those of *Bombay*, was at *Mahim*, (*Northern Conkan.*) There is a low cliff of from ten to twelve feet in height, composed of horizontal strata from one to three or four inches in thickness. On leaving the town of *Mahim* the road passes over a tract of some extent formed of these shell strata, which after some intermediate alluvial, which conceals the nature of the subjacent formation, reappear at the coast under the fort and public bungalow of *Seergaum*.

As there has been a great destruction of land at this place, the cliff under the bungalow may be viewed with interest. It averages about 20 feet in height above the ordinary level of the tides. The upper five feet is alluvial, the lower fifteen feet consisting of horizontal strata of sandstone in different states of aggregation. Nearly at right angles with the fort of *Seergaum*, a point of land runs out towards the sea, of the same general aspect as the strata just described. This seems to have been once continuous with another portion reaching out from the coast, at a distance of about five miles to the northward. The natives state that the whole bay was once land. The destruction seems to have stopped for the present at a Mussulman burying ground, where human bones may now be seen exposed; and which the fossil seeker must be careful to distinguish from "organic remains of a former world." If after another shifting of place between sea and land, a deposit should be formed above, so as to press and solidify the sand, containing skeletons, a mistake of this kind may as easily occur here, as it did at *Guadaloupe*.

The road through *Tarapúr*, *Dannú* and *Jyebúrdí* affords many opportunities of seeing sections of these strata,—all horizontal and evidently above the trap. Trap rocks still form the gradually diminishing hills inland, being the continuation of the Western Ghat range. Where the trap is exposed, as in some of the numerous creeks, it presents the same weather and water-worn appearance as in the rivers of the *Dekhan*.

It has been assumed (seemingly by Professor Jameson*) in a late summary of the geology of India, that the trap formation reaches to the *Nerbudda*. I therefore presume that there exists no written evidence to the contrary. This mistake has probably arisen from rolled pebbles of trap having been seen in the bed of the *Nerbudda*, opposite the *Kabbír Bar* a few miles above *Broach*; or it may have been a simple conjecture. The fact is, that the trap ceases on the coast between *Balsár* and *Gandávie*. The last hills being those called *Dúngrí*, a low range near the village so called, scarcely more than 100 feet in height and composed of porphyritic trap. The well known hill fort of *Punera*, near the town of *Balda Párí*, is the last trap hill of any height in this direction. At *Gandávie* are strata of clay, containing *kankar*, and from this point we take leave of trap, as well as of shell *sandstone: kankar*, and clay of various forms now present themselves in the only sections seen from *Gandávie* to *Surat*. The form and situation of the *kankar* at *Dúmus* demands future notice. The point of geological interest about *Surat* is the constant destruction and partial

* Vide British India, vol. iii. Art. Geology.

renovation of land. But especially we note here destruction and *degradation* by freshes and spring tides, where the water is all powerful, and there are no "antagonist forces," such as are imagined by those who are inclined to slight actual causes, and to controvert the principles so ably developed by Mr. Lyell. I cannot avoid here remarking, as it is a point so àpropos to the country under consideration, that a strange assumption has gone forth with regard to the powers and magnitude of tropical vegetation and its agency on the crust of the globe; as if it were a *general* law of nature that the nearer we approach to the equator, the thicker the vegetation. So that tropical vegetation must have essentially a greater power of resistance to the destruction of land than extra-tropical. Such a position is manifestly untenable on the old continent, whatever ground there may be for the opinion in the *West Indies* and *South America*. In *Guzerat* and in the *Dekhan* bareness of natural vegetation is the prevailing character; while even in *Malabar*, where the most rank vegetation exists, I have been shewn such devastation from the sea alone, that I am inclined to think that no "antagonist power" of vegetation can be worth considering. An eminent geologist*, adverting to the doctrines of Mr. Lyell, asks, "Are there no antagonist powers in nature to oppose these mighty ravages? no conservative principles to meet this destructive agency? The single operation of vegetation is a vast counterpoise to all." (!)

Should we interrogate nature in *Guzerat*, especially about the *Taptí* and *Nerbudda*, we shall find that the conservative principles of vegetation stand no chance against the destructive agency of water.

On the plateau of the *Dekhan*, degradation can only be slightly repaired in one place, by the operation of degradation from a higher level and subsequent deposit below. At the level of the sea in the *Northern Conkan* and in *Guzerat* the rains carry away vegetable mould and vegetation with it. The denuded tracts support no vegetation capable of protecting the land on which it grows from farther loss. The tides with the small portion of sediment they deposit, bring no contribution to vegetable soil. Should they throw up a shoal between the periodical rains, the next fresh would certainly carry it away. The "antagonist powers" are here freshes and tides, but they both tend to the destruction of vegetation, and to throw insuperable obstacles in the way of its renewal.

Proceeding from *Surat* through *Oolpar* to the *Kim* river, nothing but black cotton soil occurs until you cross the *Kim*, at the village

* Professor Sedgwick.

of *Kudrama*,—there sandstone and conglomerate are exposed at the surface.

River Kim, section of the right bank at Sawal.

No. 1. Alluvial containing irregularly imbedded masses of conglomerate, 6 feet.

No. 2. Three feet of horizontal strata of sandstone from one to two inches in thickness.

No. 3. Five feet of sandstone varying in hardness.

No. 4. Bed of the river, consisting of coarse conglomerate, coarser than the imbedded masses No. 1.

There is no sign of stone of any kind on the left *Oolpar* bank of the *Kim*. This formation of conglomerate and sandstones, is only known in this tract of country to extend from the village of *Koba*, through *Elao* and *Sawal* to *Súnú*.

There is reason to believe that the same rocks form the *Raj-pípla* range of hills and portions of the peninsula of *Kattywár*. The central ridge of *Kattywár*, of which the celebrated hill of *Politana* forms a part, is undoubtedly trap, the usual varieties of which are met with at *Baunagar*. The most remarkable part of this formation (of sandstone, &c.) is the cornelian deposit at the celebrated mines near the *Nerbudda* at *Rattanpúr*. These mines were described by Mr. Copland, Trans. Lit. Soc. Bombay. The general account is correct, but Mr. C. is in error with respect to the appearance of igneous action upon the hill of *Bawa Gorea*, which consists of sandstone and conglomerate rocks,—but not a trace of trap.

Leaving the town of *Okleysir* on the south bank of the *Nerbudda**, on the road to the cornelian mines through *Sarapúr*, *Clareville* and *Rappalsárí*, the flat black cotton soil plain gradually begins to undulate; and in a nullah near the new village of *Clareville* I saw the first appearance of stone (kankar of course excepted) even in fragments since crossing the *Kim*. The masses were sandstone and conglomerate. The soil now mixed with sand here gradually loses its tenacity and fitness for cotton cultivation. At length, under *Rattanpúr*, the place where the cornelians are brought to undergo the process of baking, a clear section occurs on the bank of a nullah or small river of rather saltish water opposite the village, shewing under a superficial stratum of alluvial, 5 feet thick strata of sandstone, 25 feet deep, inclined at an angle of about 70°.

* From *Hansót* to *Sugód* (and I presume farther) may be seen a deserted bed of the *Nerbudda*, the bank varying in height, consisting of clay with regular horizontal deposits of kankar. The large tank at *Sujód* is evidently a portion of the old bed of the river.

The direction of these highly inclined strata is N. E. and S. W., corresponding to similar strata on the opposite or *Rattanpúr* side of the nullah,—dip N. W. The extent of this section, as far as it is well exposed, is about 40 feet of the bank.

The banks of the nullah above *Rattanpúr* shew irregularly stratified masses of a compact earthy rock with dendritic figuring ; also a conglomerate containing some appearances, though not quite unequivocal, of fossil bone. These are not accompanied, as far as I could observe, by fossil shells, and it is only from having since found undoubted fossil matter in similar deposits that I have thought them worth forwarding for comparison.

This nullah contains rolled masses of jaspers, various agates, &c. &c., but no trace of a rolled piece of any variety of trap as may be seen in the bed of the *Nerbudda* near the *Kabbír Bar*.

In the village of *Rattanpúr* the cornelians are collected and exposed to the air for a month or two. If on being chipped they are found likely to be worth working, they are put into earthen pots (the usual water pots) with some earth and sand, and exposed to a fire for a day and night. At the end of the hot season they are sent down the *Nerbudda* by way of *Broach* to *Cambay*, to be cut and polished.

The cornelian mines are about four miles from *Rattanpúr* in a thick jungle. The people who work them return every night to *Rattanpúr*, there being no habitations near the mines. From the principal spot now working the following small hamlets are thus distanced.

Damláe, one mile south.

Ahmod, one and half mile north.

Padwana, 3 miles south-east.

To the eastward all is jungle.

The stones are said to be found over a space of about four miles.

The formation containing cornelians is a deep bed of red gravel, very like the London gravel: in it are found pebbles of various form and size, of the different species or varieties of chalcedony,—irregularly imbedded, and not in layers like flints in chalk.

The mines are usually sunk to about thirty feet, but on digging to sixty feet neither hard rock nor water is met with. I therefore conclude that this is a partial deposit entirely above the sandstone-conglomerate formation, which is denuded at the surface of the nullah before mentioned, which forms also the *Bawa Gorea* hill, and I believe the general range of the *Raj-píplas*.

As far as I could observe, there is no sign of organic remains in these gravel beds,—but every thing hereabouts should be examined carefully, as the building stones in several of the villages contain

fossil shells; so that if the people could trace them to the quarries, it might lead to some interesting discoveries in the *Raj-pípla* range.

I saw no sign of this formation from *Broach* to the *Maihí* river, opposite *Cambay*, nor on the *Tankeria Bunder* side of the gulf.

The next point at which I found conglomerate rock was at *Gogo* in *Kattywár*, where masses of rock containing shells are dug out from the beach, the upper portions having been carried away by the encroachments of the sea.

This formation will, I hope, be soon traced up the south-eastern to the western coast of *Kattywár*. I before observed that the rocks at *Baunagar* are trap. Now these conglomerates appear to contain fragments of a great variety of mountain rocks, always excepting trap. This circumstance affords suspicion that the trap was thrown up subsequently to the deposit of the conglomerates. I say merely suspicion, as I know of no evidence of upheaving, nor the nature of the strata at the points of junction. These, between *Gogo* and *Baunogal*, are either obliterated by extensive degradation, or concealed by deposits of mud.

The island of *Perim* in the gulf of *Cambay*, afforded me a better opportunity of examining the conglomerate than the denuded beach of *Gogo*.

Perim is about three miles in circumference. About half the island, proceeding round the western side towards the southernmost point, consists of strata of conglomerate rock much acted upon, but forming cliffs in several parts to a height of about 30 feet above the sea, the upper strata being of compact sandstone,—all perfectly horizontal. The conglomerate contains shells and other fossils, some undoubted bones, &c. which have been forwarded for identification to *Calcutta*.

Fine sand,—partly from the decomposition of these rocks, but chiefly, perhaps, thrown up by the tides from the opposite coast, —appears to have been blown by the south-west monsoon, so as to form *dunes* of very singular aspect, mostly rounded at the top. In one place a sand hill has a quadrangular platform-like summit. These sand-mounts seem to have formed a barrier to the farther encroachments of the sea. There is a valley to the eastern side of the island partly in turf, and some part cultivated open to the sea, where one may walk with a firm footing, while the sandy *dunes* of the higher level give way in every direction.

Proceeding from the south point towards the eastward (the open valley), layers of kankar are met with *below* the sandstone,—beyond this is a low cliff of sand,—the valley completing the circuit.

In the hope that some of our members stationed in *Guzerat* will carry on the investigation of the fossils, not only of *Perim*, but of other parts of the formation in *Kattywár*, I have hastened to lay before them this imperfect sketch, without waiting for a report on the *nature of the fossils* found, or presuming myself to offer any opinion, or to draw a conclusion on that part of the subject.

II.—*Note on Mastodons of the Sewaliks.* *By* Capt. P. T. Cautley, *Superintendent of the Doab Canal. Pl. XL.*

In the present state of the researches into the fossil remains of the Sewaliks, it will be interesting to note any discovery of peculiar interest, without entering upon a description in detail. Such a description may, with propriety, be reserved, until the possession of a more perfect and a more numerous collection of remains enables us to enter upon the description with greater confidence: whilst, in the mean time, to those who are interested in the study, the periodical announcement of progress made in our operations, cannot be devoid of interest; under this idea I did myself the pleasure of forwarding to your Society the note on the dentition of the *Mastodon Angustidens* (variety of), and now send you one on a skull of another variety of Mastodon which has been lately received. The sketches are drawn on transfer paper, and will, I hope, be intelligible.

Fig. 1 and 2, are representations of the fossil skull—Fig. 1 being the front, and Fig. 2, the profile or side view. Fig. 3 and 4, are similar outlines of the existing elephant, on a scale of one-eighth on linear measurement.

The fossil is exceedingly perfect in some respects. The left orbit and maxillaries are as sharp and well defined as in the recent skull; the frontal and nasals are tolerably perfect, the specimen is fractured obliquely, removing the temporal swellings and diploe of the cranium, together with the occipital condyles and foramen magnum; the curve of the occipital on its external surface is however retained, and although sutures are altogether wanting, and the alveoli of the tusks are mutilated, the specimen may be considered as sufficient to give a perfect idea of the form of skull; and, as a form perfectly unique amongst the proboscidean pachydermata, will be looked upon with satisfaction by all those who take interest in the additions that have of late years been so rapidly made to palæontology, and the catalogue of animals now no longer existing on the globe. The present skull derives additional interest from its being so different from the only

type of the same genus or co-genus (for it may be permitted so to designate the elephant) which has been left to us—so different indeed, as to completely modify the construction of the head, and the arrangement of the muscular and fleshy matter that must have belonged to it.

Without entering into any minutiæ of detail on the peculiarities of the head, of which the drawings will give a representation, and which detail will be reserved until our collections enable us to bring under one view all the varieties of this genus that the Sewaliks may contain, it will be sufficient, in announcing this very interesting addition to our cabinet, to draw attention to a few leading points.

In the skull of the existing elephant, the excess of longitudinal measurement, over that in the contrary direction, owing to the great development of the superior portion of the cranium, is one of the most marked peculiarities of its form; the height from the external nasal opening to the top or apex of the cranium is immense, although undergoing modification from age; this excessive development not being derived from any increase of size to the cerebral cavity, but to a wide space composed of cellular bone or diploe, giving an external and deep covering to all that space occupied by the brain; the size of the orbit is small with comparison to the temporal region; the large external nasal aperture is situated between the orbits; and the front in the Indian species is slightly depressed:—now in turning to the fossil, we find that the whole of these peculiarities, are either reversed, or modified in an extraordinary degree.

The elevated and massive cranium does not exist, the slope towards the occipital and foramen magnum commencing from the top of the external nasal opening, and falling off to the rear in an abrupt angle; the size of the orbit is large, and its encircling bones massive and prominent; the space between the orbits to the front continued up to the nasal opening, is depressed to an enormous extent, and the two lines of alveoli of the tusks strongly marked; the temporal fossæ are comparatively small with those of the existing elephant, and the temporal bones; which although broken off in the specimen from which the drawing is taken, exists in another skull in our possession, appearing to be large and composed of cellular bone. The angle formed by the tusks with the grinding surface is more obtuse than in the existing elephant, and the form of head, instead of possessing the proportion assimilating the skull of the elephant to that of man, may be considered as nearly square, or perhaps possessing a breadth in greater proportion than the length. The height of the maxillary bones which is great in the elephant, is here much exaggerated, and

the form and profile especially is so peculiar, that a glance at the sketch will, by comparison with that of the existing elephant also given, be sufficiently striking.

The suborbitary foramen is by no means large; the proportion of diploe in the upper part of the cranium bears no comparison with that in the existing elephant, these differences combined with the peculiarity of form and position of the external nasal aperture, may, in all probability, modify the extent to which this variety of Mastodon was provided with trunk; but to forbear from surmises or speculations in the present imperfect state of the inquiry, it will be sufficient to place this as a second to the *angustidens* formerly noted.

P. S.—A letter this moment received from Captain Cautley announces the discovery of a superb specimen of the *Mastodon angustidens*, a skull with both lines of molars, palate, and one orbit entire: he adds—"We have much still to learn of these *Mastodons;* with regard to the *Mastodon elephantoides* of Clift, there are evidently two species, of the same character as to dentition, but with a remarkable difference in the form of cranium, one of which has the flat and the other the elevated crown." A very perfect head of a horse has also just been extracted by the *Sewalik* working parties, from the hard sandstone.—Ed.

III.—*Additions to the Ornithology of Népal. By* B. H. Hodgson, *Esq.*

1. *Indication of a new Genus of Insessorial Birds.*

Conirostres, *Sturnidæ, Lamprotorninæ ?* Dentirostres, *Merulidæ, Crateropodinæ ?*

In the suite of specimens of Nipalese birds forwarded by me, three years ago, to the Zoological Society of London, were three or four of the subject of the present article. They were marked in the imperfect list obligingly returned to me as "a new form nearly allied to *Pastor.*" But, if *Pastor roseus* be the type of that genus, I confess I cannot perceive much affinity with our bird, either in structure or in manners. And, if a strong, arched, solid and compressed bill, united with gradated wings, and very strong feet, be *the* marks of the *Crateropodinæ*, to that sub-family, I conceive that our bird should be referred; the more especially as its shy and retiring habits are alien to those of the whole *Corvidæ*, and in a yet more particular manner, to those of the Sturnine branch of it. The Indian *Stares* seem to have perplexed systematists most wofully, though, I fancy, there is not one of us exiles 'in the land of the sun,' but readily

recognises the propriety of the *native* genus *Maina*. All the *Mainas** have a preponderant similitude of general structure and of habits, constituting generic unity, if such a thing there be; and placing these birds, in a natural system, close to the European genus *Sturnus* (secundum Linnæum); unless indeed that single genus should not rather embrace the whole of the *Mainas* sub-generically. Yet, according to the latest and most accredited systems, these birds are scattered at random amongst the *Lamprotorninæ*, the *Pastorinæ* and the *Coracianæ*, constituting the Sturnine genera *Dilophus*, *Acridotheres*, and *Pastor*, and the *Corvine* genus *Gracula vel Eulabes!* Should we feel disposed to turn from English to French systems, the matter is no way mended: for Cuvier's *Dentirostral* and *Meruline Grakles* are sundered, toto cælo, from his *Conirostral* and *Corvine Stares;* and Temminck's *type* of the genus *Pastor* is dissevered widely from all its congeners! If the first men of the age can so err for want of local information†, it is to be hoped that some of them will, ere long, see the necessity of *methodical co-operation* with those who are capable of supplying that information, and who, I will add, are most anxious to supply it, upon fair and gentlemanly terms of participation.

* We have seven species, all abundant in Nipal.

1. Religiosa.
2. Cristelloides, (nob.)
3. Tristoïdes, (nob.)
4. Sylvestris, (nob.)
5. Affinis, (nob.)
6. Communis, (nob.)
7. Terricolor, (nob.)

Of these, 2 and 3 are very nearly allied to Cristatella and Tristis; 4 and 5 to Pagodorum and Malabarica. The 6th inclines much to Sturnus; and the 7th, a very osculant species, has very considerable resemblance in the form of its wings, tail and legs, to Cinclosoma.

† So subtile and various are the relations of birds to one another, that no success can attend the ambitious project of a *general* classification conformable to nature, unless, to the intimations derived from external structure be added those derivable from internal structure and from habits and manners.

But how shall the most able man of science at home procure an adequate supply of the latter sort of information, unless he will associate to himself some intelligent and persevering local students? Dried skins are but dried skins! And why have we Zoological Societies, unprovided with travelling naturalists, if not to accomplish *some sort* of adequate union between domestic skill and foreign opportunity?

So long as the closet and field departments continue separated, so long will the multiplication of idle names and vague species go on, whilst no effectual progress will be made in the noble attempt at a natural classification.

What adds to my difficulty in attempting to class the birds now in question is, that the so-called *Pastor Traillii* (very abundant in Nepal) is, in my judgment, a typical Oriole; whilst the *Lamprotornis spilopterus* (also common here) is not easily referable to Temminck's genus *Lamprotornis*.

Mr. Swainson, who has very recently revised the *Sturnidæ* of our modern English school, characterises the sub-typical or *Lamprotornine* group of them thus. "Bill more compressed and thrush-like, its base not angulated; the tip of the upper mandible distinctly notched." In the above characters I perceive some faint traces of our bird: but when I turn to the indication of the entire family, those traces seem obliterated, for "the conic straight bill, naked nostrils, and lengthened pointed wings," of the *Sturnidæ*, essentially *conflict* with the structure of our subject.

With these preliminary remarks I shall now attempt to characterise our bird, as the type of a new genus or sub-genus, either of the *Lamprotorninæ* or of the *Crateropodinæ*, as the learned shall please.

Cútia nobis. *Khutya* (quasi *Pedatus*) of the Nipalese.

Bill equal to the head, at base higher than broad, sub-arched and much compressed throughout; strong, entire*, obtuse. Culmen considerably carinated between the nares, but not much produced among the soft and simple frontal plumes. Tomiæ erect, rather obtuse, and near to the palate. Nares broad-lunate, sub-basal closed above by a nude un-arched scale. Rictus moderate, smooth. Orbits and head plumose. Wings short, but firm; 5th quill usually longest; 2 first strongly—2 next, slightly gradated up to it. Tail short, quadrate and firm. Tarsi sub-elevate, very strong, nearly smooth. Toes compressed and ambulatory; lateral fores unequal, connected basally, the outer one as far as the joint; central not elongated; hind very large, sub-depressed and exceeding either of the lateral fores. Nails, compressed, strong, moderately bent, rather blunt†.

* Entire in the majority of my full grown specimens, but in others there is a faint notch. This liability to vary perpetually occurs in Cinclus, in Cinclosoma, in Cuculus, and in Timalia (not to mention more); rendering the task of characterising *justly*, a work of time and labour in comparisons.

† So soon as the family and sub-family of our genus be determined, a great part of the above generic definition may be omitted relatively to such determination. At present the larger divisions sadly outrun the characters which should accompany and designate them. Vide Shaw's General Zoology, vols. 13 and 14, where few of the larger divisions have any characters attached to them. Vide also the Regne Animal, Aves, wherein the subdivisions are indicated, *passim*, by two or three vague words!

Type *Cútia Nipalensis*, nobis.

Nos. 254, 255, of the new specimens and drawings in the possession of the Zoological Society. In order to illustrate the affinities of our bird, I proceed to compare it with *Pastor roseus* and with *Lamprotornis spilopterus*.

In *Pastor roseus* (as in all the typical *Pastors* in my possession) the bill is longer than the head, straight, conico-cylindric, and soft and feeble towards the base. Its gape is angulated; and the plumes of the head, carried forwards to the anteal extremity of the oval nares, are pointed, glossed, and elongated. The ample and pointed wings, have the 1st quill bastard; the 2nd, very long and nearly equal to the 3rd, which is always the longest. The tarsi are strong, elevated and heavily scaled. The toes have the laterals and hind equal, and the central fore considerably elongated. The outer fore toe has a basal connexion with the central, but the inner is free.

In *Lamprotornis spilopterus* the wings have exactly the same form as in *Pastor roseus*; and, as this identical form is also found in *Eulabes religiosa*, (not to mention more typical *Pastors*,) it would seem to be characteristically and extensively significant*. The bill of *Lamp. spilopterus*, which is scarcely longer than the head, uniformly sub-arcuated and not angulated at the gape, *so far* agrees with our *Cútia*. But its base is distinctly depressed, whilst forward it has a very slight compression and sub-cylindric outline. It is, besides, *sharply* pointed, *saliently* notched, and its trenchant fine tomiæ are *deeply interlocked*. Carry these peculiarities a little further and you have the bill of *Chloropsis*, which genus further agrees with *Lamprotornis spilopterus* almost entirely in the nature of the food of

* The generic character of Pastor gives 'remex prima longissima:' but it is not so in my specimen of the type or *Roseus*: nor in any other typical *Pastor*, if Pastor be the equivalent for *Maina*. On the other hand, if *Acridotheres* be held to be that equivalent, the 'genæ plus minusve nudæ' is true of *Tristoïdes*, not true of *Cristelloides*, which two species are, however, as nearly allied as possible and perpetually associate together, every large flock of the former having many individuals of the latter. In other words, these genera are artificial and false; neither of them being capable of comprising consistently half a dozen of the most similar birds. The cheek piece *cannot* be an influential character, or one of the above named two species would not have it, and the other want it. By consequence, I should say, the genus *Eulabes* is purely artificial; for, bating the cheek piece, there is nothing left to distinguish the single species ranged under it, but a greater degree of thickness in a bill of exactly the same essential character.

Commend me to the *old* genus *Gracula*, sub-generically divided.

Our *Maina* is the prototype of the French *Martin* and of the English *Minor*.

the species, and in the structure of their stomachs. On the other hand, the harder, blunter, more solid, and uniformly compressed bill of *Cútia*, associated as it is with a subtriturating stomach and a diet consisting of hard insects and seeds, seems to affine our bird to *Pomatorhinus* and its allies.

In *Lamprotornis spilopterus* the nares are still short and round, though there be somewhat more approach to a nude membranous tect than in *Pastor roseus*.

In *Lamprotornis spilopterus* the tarsi are rather low, and the feet suited more to perching than to walking, the soles being flattish and the nails very acute. The lateral fores (of which the outer one only has a basal connexion) are shorter in proportion to the central, and longer in relation to the hind, than in our bird, which, by its longer legs, and full soled stout toes, provided with straighter and blunter nails, proclaims its more terrestrial habits, notwithstanding the basal connexion of the fore toes. Lastly, the pointed and burnished feathers upon the head of *Spilopterus* are wholly wanting in our bird.

In *Spilopterus* they seem to intimate relationship with the *Stares:* nor is the intimation unrequired; for the habits and essential structure of this species*, when viewed in relation to whatever hath been, or can be justly, alleged of the *Sturnidæ*, savour more of contrast than of similitude. As for our *Cútia*, amidst all its anomalies (so to speak) of external structure, there is certainly something *Sturnine* in its aspect; and, by the formation of its feet and wings, as well as by its variegated plumage, it bears some resemblance to *Sturnella;* a genus "leading directly to the true starlings."

Species new. *Nipalensis* nobis. *Nipalese Cútia*, nobis.

Habitat, central and northern regions: adheres to the wilds, and feeds on hard seeds and hard ground insects.

Colour and Size. Male. Above, brilliant rusty yellow, with jet black remiges and rectrices: cap, and a large apert central portion of the wings, slaty; the former, confined all round by a black band

* Quod est, structure of the chylopoetic viscera of the bill, and of the tongue, taken collectively.

In all these respects there is a strong tendency towards Ixos, Chloropsis, Hypsipetes, and others of the frugivorous arboreal and short-legged section of those most anomalous thrushes, the other or long-legged division of which seem to make some such approximation to the Conirostres, as the short-legged section does to the Tenuirostres. Cuvier's Philedones, of which our Sibia may be taken as a perfect type—appear to unite these two very opposite sections. Sibia Picaoides has the tail and feet of Pica; and the bill and tongue of Chloropsis! But these are mysteries for the amply stored Museum and Library to solve!

proceeding through the eyes and ears from the nares. Below, from chin to legs pure white, from legs inclusively to tail, flavescent: the flanks broadly cross-barred with black: a spot of the same hue at the base of the maxilla: most of the quills and the lateral rectrices, tipped with white: lining of the wings and quills internally towards their bases, albescent: bill above blackish, below plumbeous: legs orange yellow: iris brown, 7 inches long by 11 wide, and 2 oz. in weight: bill $\frac{4}{16}$: tarsus $1\frac{3}{16}$: central toe $\frac{2}{16}$: hind toe $\frac{10}{16}$. The female is a trifle less in size: her mantle is variegated by longitudinal black drops; and her cheek-band is brown instead of black.

2. *Indication of a new Genus of Waders, belonging to the Charadriatic Family.*

Most Indian sportsmen are aware that there are two species of wader, known to the natives by the common name of *Carvának* or *Carbának;* one of which frequents dry sandy plains, and the other, sandy banks of rivers.

The former bird belongs to the genus *Œdicnemus* or *Thick-knee*, scarcely differing, as a variety, from the European type of that genus. But the latter, though possessing the same figure (even to the large head, with abrupt elevated forehead and great staring eye), as the other; and though, moreover, resembling the other strictly in the form of the legs, wings and tail, yet differs from it *totally* in the structure of the bill.

This member, which in *Œdicnemus* has very much of the *Plover* form, in the river-haunting *Carvának* exhibits the strength and size so conspicuous in the *Storks* and *Jabirus*.

I find no generic mention of such a form in the works of Ornithology accessible to me; and I therefore propose to characterise it as a new genus; subject to the correction of those whose access to libraries and museums qualifies them to lay down the law in matters of this sort.

Order Grallatores. Family Charadriadæ. Genus *Carvánaca*, nobis.

Character.

Bill twice as long as the head, sub-recurved, strong, convex above, considerably compressed; the base thickish and rounded; the tomiæ very trenchant, locked, and denticulated and notched towards the tip, as in *Ardea*. Nares broad-linear and placed forward in a wide membranous fosse, extending $\frac{1}{3}$ from the base to the tip of the culmen. Tongue long, narrow, fleshy: towards the point cartilaginous, and the point itself sub-bifid. Form of the head and body, of the feet, wings and tail, as in *Œdicnemus*.

Type *Carvánaca Grisea*, nobis. *Œdicnemus Magnirostris*, Hardwickii ?

Specific character.

Carvánac. Above, a sky grey: below, together with the frontal zone, white. Brows, ear-coverts and mustaches, blackish. Shoulders, false wing, and coverts next them, together with the quills and tip of the tail, blackish. Wings and tail irregularly but largely banded with white, and both white for the most part, below. Length of the bird 20 inches, width 36, weight $1\frac{1}{4}$ lbs.

The marks. This species inhabits the Bengal Presidency, very generally, being always found on the wide sandy banks of the larger rivers during the cold months of the year. It migrates to Tibet in summer, and passes over Népal on its way to and fro. Its food consists of crabs and other hard-shelled fish. Its intestines are from 22 to 25 inches long, with two cæca, each $3\frac{1}{4}$ inches, placed at 5 inches from the lower end of the gut. The stomach is a strong triturating gizzard, fitted with the aid of gravel, to grind the hard parts of the bird's food.

Manners cannot well be more dissimilar than those of the desert and ripuary *Carvánacs:* the former adhering to dry arid plains, very much like the Indian Bustards* ; and the latter, as exclusively to the beds of rivers. Whoever will refer to the English Cuvier, (Aves. III. 307,) will perceive that our *species* is probably not unknown to science. Is it not the *Œdicnemus Magnirostris* of Hardwicke ?

At the place quoted, two other allied species are cited, and these three may constitute the new genus or sub-genus *Carvánaca*, distinguished from *Œdicnemus* by totally different manners, and by a truly cultirostral bill.

It were well, indeed, if all new genera rested on diversities so marked as these—the manners so admirably tallying with the structure of that grand instrument of sustentation, the rostrum. Our genus, moreover, appears to me to constitute a remarkable and distinct link of connexion between the *Ardeidæ*, by means of *Mycteria* and the *Charadriadæ* through *Œdicnemus*. And it would, in my judgment, be quite as consonant to nature to confound *Œdicnemus* with *Charadrius*, as *Carvánaca* (nobis) with *Œdicnemus*.

The only consequence of Hardwicke's species proving to be the same with ours, ought therefore to be—not the rejection of the new genus, but—the merging of my specific name of *Grisea* in his of *Magnirostris:* unless indeed, the latter term be not held to have lost

* It is frequently called by us the Bastard Florican.

its significance in relation to a genus as much distinguished for the strength and size of the bill, as any one of the *whole order*.

3.—*Indication of a new Genus of the Falconidæ.*

Falconinæ, Vigors. Genus new. *Báza*, nobis.

Generic character. Bill as in *Ierax*, but somewhat longer: upper mandible, with two sharp teeth on either side the hook, directed forwards: lower mandible with three or four smaller ones, on each side, correspondent to the former. Nares transverse, long, and linear, with the cere behind them membranous and free to base of bill. Legs and feet short and thick. Tarsi low, half plumed, coarsely reticulate. Toes short, cleft, inner fore and hind somewhat depressed and the latter large. Aeropodia wholly reticulate. Talons sub-equal, acute, squared below.

Wings long, equal to tail: 3rd quill longest.

Type. *Báza Syáma*, nobis.

In addition to the above significant particulars, (some of which may hereafter be omitted in the generic character,) I may add that the orbits, lore, and sides of the cere are clad in soft, composed plumage; that the cere is short and nude above; that the bill has great breadth and depth at the base, corresponding with the broad flat head and large eye of the true *Falcons*, and, both of which distinguish our bird no less; that the first and second quills are but moderately gradated*, and all three pretty sharply emarginated towards their tips, though not so near as in *Falco* or in *Ierax*; that the tail is of medial length and square; that the tongue is bifid; and that, lastly, the feeble feet are remarkable for the sub-equality of the toes and talons, the roughness and levelness of the soles, and the size and depression of the thumbs. The complex affinities of this singular genus are obviously with *Cymindis*, *Harpagus* and *Ierax*. It is more nearly allied to the last, and its position (in Vigors' arrangement of the *Falconidæ*) clearly is at the head of the *Falconinæ*, and leading from the genus *Gampsonix* to the genus *Ierax*. It differs from *Ierax* by its cymindian nares, its long wings, and its cleft toes, with unballed and depressed soles.

Species new. *Báza Syáma*, nobis.

Black, glossed with changeable blue or green: the belly and sides, rufous white, crossed by five or six broad bars of lake tinged ochreous red: outer web of the secondaries, the same hue—of the tertials,

* 1st is 1½ inches, and the 2nd ½ an inch, less the 3rd: the rest rapidly fall off; and the primaries exceed the tertiaries by nearly three inches. The scapulars are of good length.

white: scapulars and long coverts nearest them, whitened internally: a broad white gorget on the breast: remiges and rectrices plumbeous, for the most part, on the lower surface: legs and bill plumbeous: talons and tip of the bill, black: iris brown: a long slender drooping crest from the occiput: 13 inches long by 30 wide and 7 to 8 oz. in weight: bill, $\frac{14}{16}$: tarsus, $1\frac{5}{16}$: central toe, 1.

Remarks. These birds are peculiar to the great forests of the *lower region*, so far as I yet know. The sexes are alike both in size and colours: both in young and moulting birds the leaden colour of the legs is lost in fleshy grey—that of the bill, in dusky grey; and the powerful complex dentation of the bill, (both mandibles) is in the juniors only traceable as a festoon upon the upper mandible.

4.—*Indication of a new Genus of the Picidæ, with description of the type. A new species, also, of two new species of the Genus Sitta.*

Yunxinæ, Swainson. Genus new; *Sasia*, nobis. *Sasya* of Nipal.

Generic character.

Bill equal to the head, conico-compressed, pointed and entire: the base furnished with tufts of hair as in *Bucco*.

Nares round, basal, lateral, remote, and concealed. Tail short, soft and square; wings equal to the tail, full, soft, first quill sub-bastard, 5 and 6, longest and equal; tertials sub-equal to primaries.

Feet three-toed, hind toe stoutest, sub-equal in length to outer fore; inner fore connected to first joint. Nails somewhat straightened and obtuse.

Tongue as in *Picus*.

Type, *Sasia ochracea*, nobis.

Species new. *Ochracea*; *Ochreous* red *Sasia*.

Form. It has been described above. In further illustration of it we may, however, add that this singular bird has a close relationship with our *Vivia*, from which it differs by its rather longer and *perfectly un*angulated bill; by its shorter, even tail; by the *Bucco*-like tufts of its bill; and, above all, by its three-toed feet, the nails of which have hardly any of the scansorial falcation and acuteness. Its orbits are nude, and it has a transverse corneous opercule *before* the eye.

Colour and *Size*. Subochreous red, with greenish yellow cap and wings; a white streak from behind each eye; and jet black unmarked tail.

Wings, internally, dusky; on their lower surface towards the bases of the quills, as well as the lining of the wings, buff. Legs fleshy yellow: bill plumbeous with a dusky ridge: orbitar skin plumbeous: iris brown: size very minute, $3\frac{1}{2}$ inches by 7, and $\frac{1}{3}$ oz. in weight;

tarsus $\frac{10}{16}$: anteal outer toe $\frac{8}{16}$: its nail $\frac{5}{16}$: sexes alike: Habitat, forests of lower region.

Remarks. On a recent occasion I quoted *Vivia Nipalensis*, (nobis) as the smallest of the family*. The above singular bird is still smaller, and both by its extraordinary form, and by its diminutive size, confirms the assertion then hazarded, that the vast forests of Nipal yield to none in the world in the number and variety of the Woodpecker tribe.

Certhiadæ. Genus *Sitta* auctorum. Species new; *Corallina*, coral-billed *Sitta*, nobis.

Form, as in *Castaneoventris*†, but considerably smaller in size. Above, soft sub-cerulean blue, tinged with lilac on the cap: below, sordid greyish: chin white: forehead black: great quills and lateral rectrices, blackish; the latter, white-tipped: legs plumbeous grey: bill intense coral red; iris straw yellow: $4\frac{3}{4}$ inches long by $8\frac{1}{2}$ wide, and $\frac{1}{2}$ oz. in weight: sexes alike. Habitat, central and northern regions.

Species 2nd, *Nipalensis*, nobis.

Above, saturate blue, darker than in *Castaneoventris* and with a purplish tinge; below, rufescent deepening as you descend the body, and showing full rusty on the lower flanks, vent, and inferior tail coverts: from the nostrils through the eyes to the shoulders, a black band: quills and lateral tail feathers, blackish: a white spot at the base of the two central rectrices; and the lateral ones blanched towards their tips: legs fleshy grey: bill dusky blue, changing to fleshy grey towards the base: iris dark brown: sexes alike: size of the precedent, and habitat the same.

5.—*New species of Hirundinidæ.*

Cypselus. *Chætura.*

Species 1st. *Nudipes*, nobis.

Form and size. Bill typically cypseline with large vertical nares, wings exceedingly firm and long; 1st quill longest, more than two inches beyond the tail: tail shortish, quadrate, longer than the coverts, composed of ten very firm square-pointed feathers, the rigid straight shafts of which are produced into naked acute spines. Tarsi longer than any toe, nude, smooth. Toes longer and more unequal

* A mistake, I find: for *Picus Minutus* is but $3\frac{1}{2}$ inches long, or, precisely the size of our present subject.

† Also a Nipalese species: and these hills have therefore afforded three species to a genus previously limited to one—or, at most, two, if *Pectoralis* prove to be distinct.

than in *Cypselus*, with the hind one distinctly versatile. Talons strong and scansorial; $8\frac{1}{2}$ inches from tip of bill to tip of tail, and 20 inches between the wings. Weight $4\frac{1}{2}$ oz. Tarsus $\frac{1}{1}\frac{1}{6}$, central toe $\frac{9}{1}\frac{9}{6}$. Colour, head as far as the eyes and ears (inclusive), dorsal neck, sides, rump, upper tail coverts, wings and tail, dusky-black with a changeable blue or green gloss: chin, throat, and most part of the neck in front, confluently white: bottom of the neck, on the anteal surface, breast, and body below, sooty brown: vent, inferior tail-coverts, and a lateral stripe from the thighs, backwards to them, white, more or less picked out with blue glossed black: back and scapulars, whitey-brown: inner web of the last tertiaries, pure white: legs purpurescent dusky: bill black: iris dark-brown: sexes alike. The young want the blue or green gloss of maturity: the clear whitey-brown of the back and pure sooty brown of the belly are in them blended into an uniform dusky hue; and their throat is of a very sordid white.

Remark. This singular species, by the structure of its feet, opens a passage from *Hirundo* to *Cypselus*. Though variously allied to *Pelasgia, Acuta, Caudacuta, and Gigantea,* it exhibits, I believe, a distinct type of form—being certainly not a *Chætura* as defined by Stevens, nor a *Cypselus* of Illiger; far less a swallow. It climbs with great power aided equally by its talons and its tail. Its habitat is the northern region, whence it sometimes wanders into the mountains of the central, avoiding however the open and level country. I have set it down in my note book as the type of a new genus, called *Hirund-apus.*

Species 2nd. *Cypselus Nipalensis,* nobis.

Sooty black, glossed with green: chin, throat, and top of the neck in front, confluently white: a white bar across the rump: talons and bill, black: iris brown: nude part of toes, dusky-grey. Size small; $5\frac{1}{2}$ by $12\frac{1}{2}$ inches; and barely one oz. in weight: sexes alike: structure typical: tail, short and even.

Remark. This is the common Swift of the central region, where it remains all the year, building under thatched roofs, and against the beams of flat roofs. It lays two white eggs and breeds repeatedly.

Genus *Hirundo.* Species 1st. *Nipalensis,* nobis.

Cap, back, scapulars and wing-coverts, brilliant deep blue: quills, tail feathers, and the longer tail coverts above and below, dusky: a narrow frontal zone, cheeks, neck, and body below, as well as the rump and lesser tail coverts above, rusty; paler and striped with narrow lines of dusky hue on the whole abdominal surface: dorsal

neck, more or less blotched with blue; rump, immaculate: bill, black: iris, dull brown: legs, fleshy-grey: sexes exactly alike: structure typical: tail long and deeply forked: size of *H. Rustica.*

Remark. This is the common *Swallow* of the central region, a household creature remaining with us for seven or eight months of the year.

Species 2nd. *Rupicola*, nobis.

Earthy grey brown: below, from the chin to the vent (exclusively), rufescent white: legs fleshy grey: bill black: iris brown: sexes alike: larger than the last, $6\frac{1}{2}$ by $14\frac{1}{2}$ inches, and weight $1\frac{1}{2}$ oz.: structure typical: wings exceeding the short and subfurcate tail. Habitat, the central and northern regions: not migratory: adheres to the mountains, preferring rocky situations.

N. B. The remaining Hirundine birds of *Népal* are *Hirundo Rustica* and the Sand-Martin; both of which, but especially the latter, are common.

IV.—*Description of the Shell and Animal of Nematura, a new Genus of Mollusca, inhabiting situations subject to alternations of fresh and brackish water. By* W. H. Benson, *Esq. B. C. S.*

Animal.—Caput tentaculis duobus setaceis oculis posticè prope bases tentaculorum sessilibus; proboscide elongatâ, cylindraceâ, extensili.

Pes ovato-oblongus, medio ventricosus, posticè angustatus, acuminatus, processu brevi filiformi subito desinens; anticè expansus, medio profundè emarginatus; alâ utroque latere porrectâ latè angustatâ, acuminatâ.

Testâ ovatâ, ventricosâ, à latere compressâ, ultimo anfractu insuper aperturam angulato, deflexo. Aperturâ integrâ constrictâ, orbiculari, suprà vix angulatâ; peritremate acuto leviter intus incrassato. Operculo tenui in spiram planam convoluto.

The snout is capable of great extension, and the animal is able to lick the summit of the shell with its extremity, which is armed within the mouth with a pair of strong vertical jaws, each apparently consisting of two pieces: these are constantly in motion in a vertical direction. The centre of the foot has a rounded peltate appearance, occasioned by the adaptation of its form to that of the operculum, which is visible through the transparent foot when viewed on the under side. The singular short filiform process attached to the extremity of the foot appears to be the termination of a nerve or minute canal, which is seen extending directly up the centre of the foot until it is lost under the operculum. The excrement is voided from the right side of the animal.

The shell is compressed laterally in a direction parallel to the axis and to the plane of the aperture, as in *scarabus*, but the prominent edges are rounded, and the former lips do not leave a ridge or keel at each semi-turn as in that genus. The sudden deflexion of the last whorl above the aperture, and the consequent depression and constriction of the aperture is a singular feature in the shell, and, in conjunction with its compressed form, led to my pronouncing the species to be a type of a distinct genus before I became acquainted with the animal or the operculum.

The first specimens which I saw, were shewn to me by Mr. Cracroft, who found them destitute of inhabitant or operculum in the *Sunderbans* east of the *Jabuna* river. He was unable to state whether they were land or water shells. Their occurrence in the delta of the Ganges so near to *Calcutta*, spurred me to diligence in the search after the species, and, about a couple of months subsequently, I discovered it alive between high and low water mark in pools, and on wet mud recently left by the tide in the river *Hooghly*, immediately opposite to the Esplanade. Here they were accompanied by *Melania lirata** and *Melania pyramis**. Dr. Pearson subsequently found them in the mud deposited by the aqueduct which passes in front of the Town Hall. Here we found them accompanied by assiminia fasciata, and by small specimens of novaculina gangetica. I also took specimens attached to a floating bamboo in the Salt-water Lake in company with *Neritina depressa*.

Though found between high and low water mark like assiminia fasciata, nematura does not otherwise resemble it in its habits, as it never attempts to creep out of the water in which it is placed, but ascending to the surface swims with the foot reversed in the same manner as *lymnæa, planorbis, paludina,* and the smaller *melania* use to do.

I have named the species on which the genus is founded

Nematura† *Deltæ*. Testâ ovato-conicâ, à lateribus tumidâ, lutescente, ultimo anfractu ventricoso, majori omnibus obliquè minutè striatis; spirâ brevi; apice acuto; umbilico evanescente. Long. 0.25 poll.

* *Melania lirata*, described as species D, and *melania pyramis* as species B, in *Gleanings in Science*, vol. ii. p. 22. Species A of that paper, I have elsewhere more fully described as *M. variabilis*, and I have named species C *M. elegans*.

† Lamarck has a genus of insects named *Nemoura* from *νῆμα* filum and *οὐρὰ* canda; but as he neglected the rules of composition the appellation of the present genus, while it expresses a singular feature in the animal, will run no risk of being confounded with that of the eminent naturalist.

V.—*Note on the Genus Pterocyclos of Mr.* Benson *and Spiraculum of Mr.* Pearson. *By Dr.* William Bland.

On the 27th of May last, I was fortunate enough to fall in with a shell of this genus, on the islet of *Susson*, one of the *Boontin* group, opposite to the peak of *Queda*, and in sight of *Pulo-Pinang*. Although the general description of my specimen answers to those above-mentioned, yet in some particulars it differs from both. The mouth is circular, its upper half marked inside by a double slightly raised line, from whence the pterygoid process is sent off which overhangs and forms the sinus, but the inside edge of this process does not touch the penultimate whorl as in Mr. Benson's shell, and it certainly differs from those of Mr. Pearson. In the specimen of *Pulo-Susson*, the sinus is $\frac{1}{10}$ of an inch from the rings above-mentioned to the outside arch, and from this arch to the extremity of the wing which overhangs and forms the sinus is $\frac{3}{10}$ th of an inch; the wing in breadth is $\frac{6}{10}$ th, mouth thickened, which thickening is carried on to strengthen the wing on its upper part. Shell one inch in diameter, with dark orange zig-zag lines across the whorls, and a band of a darker colour running longitudinally on the centre of the last whorl. Animal recently dead, but in a state of decay, so that nothing could be made out of it.

As one drawing is worth many descriptions, I have cut a leaf out of my book, having two figures of the natural size of the shell in question, No. 1, for your inspection; and, to assist in elucidating the history of this genus of beautiful shells, I have added another figure, No. 2, found at *Trincomalee*.

This shell has a small pterygoid process bending down, and in contact with the penultimate whorl, extending $\frac{1}{8}$th of an inch in front of the circular mouth, but no vestige of tube or sinus obtains in this specimen; lip thickened and reflected; the shell having all the appearance of maturity; diameter $\frac{7}{10}$ th of an inch; operculum convex, horny-formed, of circular layers.

Note on Dr. Bland's *Paper.*

The *Susson* species appears, from the drawing forwarded with the description, to belong to the typical group of *Pterocyclos*, which includes *P. parvus* and *rupestris*, and to be intermediate between the latter species and *hispidus*, to the last of which it exhibits an approach in the irregular aperture and dilated and thickened wing; but in the absence of a specimen for comparison, no specific character can be assigned with safety.

The *Trincomalee* shell is interesting as an arborant form, indicating the passage to *Cyclostoma*, which it approaches through the alate species, *C. petiocrianum* of Gray. It appears to possess the convex *operculum* composed of spirally concentric and exserted laminæ which characterizes the typical species of *pterocyclos*. This character seems to be gradually developed in the opercula of the *Cyclostomadæ* as the umbilicus widens, and the shell becomes more discoid; varying from the flat operculum of *C. elegans* through that of *C. involvulus*, where the edges of the laminæ are partially disengaged, and that of *C. termistriatum*, which is thickened and shews a strong spiral keel, to the convex and spirally laminar structure of the *pterocycloid* group.

The species of *Cyclostoma* from *Neemuch*, described by Lieutenant Hutton as No. 26, in page 520, vol. iii. J. A. S. I have ascertained by a comparison of specimens to be *C. semistriatum* of Sowerby, whose examples were procured from *Poona*.

Query. May not the impression of a supposed species of *Cirrus* noticed in Dr. Ward's paper on the geology of the Elephant Rock in the *Queda* country, printed in the second part Trans. Phys. Class, p. 166, be that of one of Dr. Bland's species of *Pterocyclos* from *Pulo-Susson?* A reference to the specimen No. 4 will decide.

VI.—*Note on the Nautical Instruments of the Arabs. By* James Prinsep, *Sec.*

Since the arrival of the Arab vessels which annually frequent the port of *Calcutta*, I have made diligent inquiries concerning the instrument in use among them for the measurement of the latitude, in hopes of elucidating thereby the Baron Von Hammer's translation of the "*Mohit*" (see p. 442). I have been hitherto unsuccessful, the English quadrant or sextant having generally superseded the more ancient and clumsy apparatus. One *Muallim*, however, seemed to recognize the instrument perfectly by my description, though he could not explain its construction; and promised to bring me one on his next voyage:—he stretched out his arms, when I inquired about the *issabah* division, and placing his fingers together horizontally, counted with them the height of the polar star, just as I guessed must have been the early and rude method of the Arab navigators.

At length in a vessel from the *Maldive* islands I met with an intelligent navigator who brought me the primitive instruments with which he was accustomed to work his way to *Calcutta*,—and as I do not think they are generally known, while it is certain they are of Arabic origin, I hasten to describe them as lithographed in Plate XLVIII.

Arabic Nautical Instruments.

fig. 2

Horizon

fig. 1

Horizon

fig. 3

fig. 4

Horizon

fig. 5.



W. Prinsep lith.

Printed at the oriental Lith. Press.

Fig. 1. is the كمال *kamál*, an instrument for taking the altitude of the polar and circumpolar stars*, in its most elementary shape.

It consists of a small parallelogram of horn (about two inches by one) with a string (or a couple of strings, in some instances), inserted in the centre. On the string are nine knots. To use the instrument for taking the height of *polaris*, the string is held between the teeth, with the horn at such a distance from the eye, that while the lower edge seems to touch the oceanic horizon, the upper edge just meets the star: the division or knot is then read off as the required latitude.

The mode of marking off these knots is curious. Five times the length of the horn is first taken, as unity, and divided into twelve parts: then at the distance of six of these parts from the horn, the first knot is made which is called "12." Again the unit is divided into eleven parts, and six of these being measured on the string from the horn as before, the second knot is tied and denominated "11." The unit is thus successively divided into 10, 9, 8, 7, and 6 parts, when the knot tied will of course exactly meet the original point of five diameters: this point is numbered "6." Beyond it one diameter of the horn is laid off for the "5" division, and one and a half again beyond that for the "4" division, which usually terminates the scale.

It is easy to determine by calculation the value of these several divisions, measured from the centre of the horn or diameter *b d*, and at right angles to it. They represent the tangents of the angle *c b a*, to radius *b c*, or cotangents to the complementary angle *e b a*: but *e b a* is equal to *b a c*, which is half of *d a b*, therefore the divisions represent cotangents of half the angle of observation. To judge then of their actual value, expressed in altitude, we have but to convert their numerical ratio to radius, by a table of natural cotangents, into degrees and minutes; and to take the double as the latitude in each case: thus, the horn being equal to double radius *b c*, we have

						Cotng. of half angle.	Lat.	Diff.
The first division, No.	12	= 2 × 5 ÷	12 × 6	=	5.00		22°38′	
	11	10 ÷	11 × 6		5.45		20 46	1° 52′
	10	10 ÷	10 × 6		6.00		18 54	1 52
	9	10 ÷	9 × 6		6.66		17 4	1 50
	8	10 ÷	8 × 6		7.50		15 12	1 53
	7	10 ÷	7 × 6		8.57		13 18	1 53
	6	10 ÷	6 × 6		10.00		11 24	1 54
	5	10	+ 2		12.00		9 32	1 52
	4	10	+ 5		15.00		7 36	1 56

It will be seen by the last column that the harmonic progression of the divisions obtained by this simple rule, agrees very closely with

* The man assured me it was for taking the longitude, and promised to come one night and use it in my presence, but failed.

equable increments of the angle of elevation, falling somewhat short of two degrees for each division. Further the highest number, 12, gives nearly the latitude of *Calcutta*, or 22° 38′, the most northerly latitude for which the *Maldive* navigators have any occasion; while the lowest mark, 4, gives the latitude (nearly) of the southern point of *Ceylon*, or the average of the *Maldive* islands.

It is a circumstance worth noting, that if the unit had been assumed at 6 diameters instead of 5, there would have been obtained a series of divisions almost identical with the *issabah* of 1° 36′ used by the navigators of the fifteenth century* according to the *Mohit*. The series may also be extended both ways without very much deviating from the same progression: thus, commencing with

			Lat.	Diff.
12 × 6 ÷ 16 =	4.50	Cotang. of half angle.	25°04′	
15	4.80		23 32	1° 32′
14	5.14		22 01	1 31
13	5.54		20 28	1 33
12	6.00		18 56	1 32
11	6.54		17 24	1 34
10	7.20		15 48	1 34
9	8.00		14 14	1 34
8	9.00		12 40	1 34
7	10.29		11 06	1 34
6	12.00		9 32	1 34
5	14.40		7 56	1 36
4	18.00		6 22	1 34
3	24.00		4 46	1 36
2	36.00		3 10	1 36
1	72.00		1 36	1 34
0	infinite		0	1 36

In this manner a string, or a staff, may be marked off into tangential divisions, equivalent to the *issabah*, from *zero* or sixteen *issabah*, or up to an altitude of 25 degrees, within a limit of error by no means appreciable to the Arab *nakhoda*, and hardly of consequence to the refined navigator of modern times. Whether the practical rule thus developed was or was not resorted to, it is very plain that it might have been so adapted; and all the latitudes in Sidi's work might have been worked thereby; and the lower series of divisions might be nothing more than the same divisions numbered inversely on the lower side of the square staff, as will presently be noticed.

Fig. 2, the *bilisty*† is an evident improvement upon the original cord; a square rod of ebony being substituted for the stretching cord, and the radius being made to slide thereon at right angles. There is economy of space also,—the four sides of the wooden rod admitting of four series of divisions, adapted to four sliders of different sizes, so as to increase the scale without lengthening the rod inconveniently. Still the string

* See page 445. † بلستي

has the advantage in point of portability. The rules for dividing the wooden bar are the same as for the string, but the marks must be laid off invertedly, beginning at the eye end, which is in this the fixed point.

Fig. 3 is an instrument still used by the Arabs for taking the sun's altitude. It is exactly the same in principle as the above, but to obviate the inconvenience of looking at the sun, the eye is directed to the opposite point of the horizon, from the lower end of the cross bar, while it brings the solar shadow of the upper end of the same to meet the horizon by adjusting the slider *d* to or fro on the divided arm. The mode of dividing this arm, as performed in my presence by the *muallim*, or pilot, is represented in the plate; but it is obviously incorrect. A space *c e* is laid off equal to radius *a c*; from *e* a perpendicular *e f* is raised, and with the same radius a quadrant *e g* is drawn, which is divided into eighteen equal portions (of five degrees each); through these points are drawn radii to meet the tangential line; and the subdivision into simple degrees, and sixths, is either done by the eye, or by a continuation of the same rule. It will be seen on inspection of the figure, that as the angle *g f d* is equal to the sum of the angles *f d b* and *b d e*, while *b d e* is equal to *half* the angle of observation, angle *g f d* can only be equal to angle of observation when *f d b* and *b d c* are equal, and that the 90° point is therefore the only true one on the scale of divisions. The true mode of division is, as in the case of the string, to describe a quadrant from centre *b*, and to draw radii through each semi-degree of the arc from 45° downward, because the angle of observation *a d b* is, as before, equal to twice the angle *f b d*, of which *c d* (*c* 0, *c* 10, *c* 20, *c* 30, &c.) are respectively cotangents.

To ascertain whether the fault lay with my Arab informant, or with the instrument, I compared the actual divisions on the latter with a scale of cotangents, and found the following results, calling the radius *a c* = 1.00.

Angle of altitude.	Angle marked.	Length *c d* or cot. ½ angle.	True angle deduced.	Error of division.	Error if false mode had been used.
90°	0°	1.000	90° ′	0°	0° ′
85	5	1.096	84 46	—0 14	—0 30
80	10	1.196	79 48	—0 12	
75	15	1.308	74 46	—0 14	
70	20	1.435	69 44	—0 16	—3 30
65	25	1.557	65 26	+0 26	
60	30	1.719	60 22	+0 22	
55	35	1.911	55 14	+0 14	—7 27
50	40	2.142	50 04	+0 4	
45	45	2.418	45 0	0	
40	50	2.759	39 50	—0 10	—10 23

It is evident from this comparison, that the instrument was divided on correct principles, and that the *muallim* had ventured upon an explana-

tion without duly qualifying himself by consulting his books. It is also clear that the same set of divisions may be made to serve for night observations by placing the eye at *d:* but as they only embrace altitudes exceeding 40 degrees, the instrument would not be applicable to the polar star in equatorial latitudes.

In conversing with the same *muallim* on the track taken in different monsoons, I remarked that he always talked of sailing upon different stars, in lieu of different points of the compass, as we should express ourselves. It immediately occurred to me, that this might explain some of the obscurities of the *Mohit*, where, for instance, that work directs the polar altitude to be found $7\frac{1}{2}$ inches at the "setting of *Aquila;*" it might mean that the ship should steer upon the setting point of *Aquila*, until the pole should be depressed or raised to the altitude indicated.

I endeavoured therefore to procure an Arabic compass, but not one could be met with in all the vessels—at length my friend Syed Hosein Sidi found a drawing of it in one of the practical works on navigation, (the *májid kitáb**) in possession of a *nakhoda*, and without ceremony tore out the leaf to shew it to me, as the captain was afraid of parting with the volume, without which doubtless he would have been greatly at a loss on his return voyage. I immediately made a lithograph drawing of it (fig. 5) exactly as I found it, with the circle of English numbers, shewing it to have been copied from a European card, around which the names by which the Arabs "box the compass," had been entered as more conformable to their own practice.

These names would seem to point to a time anterior to the invention of the magnetic compass, when indeed the only way of ascertaining the relative position of a ship at night in the broad ocean was by observing the points of the horizon where prominent stars rose and set. The system could only have been adapted to intertropical navigation, wherein no very great variation occurs in these azimuths, and it is necessarily but an approximation to truth, as hardly any of the prominent stars selected rise or set at the precise azimuth named from them. By the positions assigned to some of the southern stars, we must suppose that it was framed rather to suit places northward of the equator; but in drawing out the following comparative view, I have thought it preferable to enter the azimuth of each star on an equatorial projection, when of course the azimuth is equal to the polar distance, and the compass card thus affords to the Arab *nakhoda* a rude

* ماجد كتاب or, as my Maldive friend facetiously expressed it, the "*John Hamilton kitáb*" of the Arabs. It would be a work of great utility to print an edition of this volume, with emendations and additions suited to the people, who depend upon it as we do on our Greenwich Ephemeris!

table of N. P. D. by which he may, if he please, take his latitude, with the simple instruments above described.

The card may be divided into two great portions, the eastern and western, in which the same names of stars occur in a direct and inverse order—on the east with the prefix مطلع *mutalá,* or "rising place of;" on the west with that of مغيب *maghíb,* "setting place of:" the north-eastern quarter has written on its circumference,

من الجاه طرف المطلع مطلعي شمالي العرض زايد والطول زايد

"From the *north* towards the *east*, *Mutalái Shimáli*,—(the *north-eastern* quarter,)—latitude increasing, longitude increasing."

The south-eastern in like manner has the words:

من المطلع طرف القطب العرض قاصر والطول زايد مطلعي جنوبي

"From the *east* towards the *south*, *Mutalái Janúbi*, (or the *south-eastern* quarter,) the latitude diminishes, longitude increases."

The north-western:

من المغيب طرف الجاه مغيبي شمالي العرض زايد والطول قاصر

"From the *west* to the *north*, the *north-western* quarter, *Maghíbi Shimáli*, latitude increasing, longitude decreasing."

The south-western:

من القطب طرف المغيب لمغيبي جنوبي الطول قاصر و العرض قاصر
على هزالجناب اذاكنت شمالي الخط *

"From the *south* towards the *west*, *Maghíbi Janúbi*, the *south-western* quarter; longitude decreases and latitude decreases;—when you are to the north of the line."

The final words, *when you are to the north of the line,* apply equally to the remarks on all four quadrants; for example, when you sail on any point of the compass between north and west, you increase your latitude and longitude—and so forth.

The north point, or pole, is called, as in Sidí Alí's work جاه *jáh,* a word not to be found with this acceptation in our dictionaries; nor is قطب *qutb,* generally confined to the south pole, but rather the contrary. مطلع *matlá,* the rising place, and مغيب *maghíb,* the setting place (to wit, of the sun) are the terms used for the east and west cardinal points. It will be sufficient to enumerate one series of the intermediate *stars* in the order of their occurrence on the card.

1. N. by W. 11° 15°. مغيب فرقد, the setting point of *farqad,* the calf; one of the two stars known by the name of *farqadain,* (β et γ ursæ minoris.) η approaches nearest to the required north polar distance.

2. N. N. W. 22° 30′. مغيب نعش, the setting of *nâsh*, the bier. This constellation comprises the four stars of the belly, both of the small and the great bear, but generally and in the present instance, the name applies to the latter, of which, however, the position is nearer 30 degrees than $22\frac{1}{2}$ in azimuth.

3. N. by N. 30° 45′. مغيب ناقة, the setting of *náqeh*, the she-camel, probably the same as العناق, the goat, of Dr. Dorn's celestial globe, the middle star of the tail of the great bear, *N. P. D.* 34°.

4. N. W. 45° 0. مغيب عيوق, the setting of *áyúq*, the kitten, αιουκ of the Greeks, or capella; whose north polar distance is in fact $44\frac{1}{4}$ degrees.

5. N. W. by W. 56° 15′. مغيب واقع, the setting of *wâqd*, the vulture, *wega* of our astronomy or α lyræ, *N. P. D.* $51\frac{1}{2}$ degrees. This is the star translated by the Baron Hammer as *Aquila;* but the azimuth shews it to be Lyra.

6. W. N. W. 67° 30′. مطلع سماك, the setting of *simak*, contracted for سماك الرامح *simák ul rámd*, the spear-bearer, Arcturus, *N. P. D.* 70°. It is *Ascimech aremeah* of the Alphonsine tables.

7. W. by N. 78° 45′. مطلع الثريا, the setting of *surayá*, the Pleiades. The north polar distance of these stars differs so much from the azimuth here assigned, (being only 67°,) that the name is possibly applied to Aldebaran, (*N. P. D.* 73° 50′) although the latter is the true Arabic denomination of α Tauri.

8. W. 90°. مغيب, the setting place (of the sun), nearly constant in the equatorial regions.

9. W. by S. 101° 15′. مغيب الجوزا, the setting of *jozá*, a contraction for رجل الجوزا the giant's foot, known to Europeans as Rigel in the right foot of Orion, *N. P. D.* 98.24.

10. W. S. W. 112° 30′. مغيب النير, the setting of *tír*. I do not find any star of this name on the celestial globe described by Dr. Dorn in the Roy. As. Soc. Trans., nor is the word Arabic. The similarity of sound and near coincidence of azimuth might incline me to consider it as Antares, (115° 40′,) were it possible that the word نير *nír*, bright, in the passage quoted by Dorn from Ebn Muhammed, could be changed to تير the name of the star before us: the passage is as follows:

وصورة العقرب معلوم الاكثر معروف ويكون عند مغرز ذنب كوكب نير احمر من القدر الثاني هو قلب العقرب من منازل القمر*

"The constellation of the scorpion is known to every one: on the buttock there is a bright reddish star of the second magnitude,

which is the scorpion's heart." If the Arabic name of this star be *qalb ul áqrab*, whence was our name of Antares derived?

The only other resembling *tír* in sound is الطاير marked as *Atair* on our globes, and comprehending the three bright stars of *Aquila*; but the position of this constellation puts it out of the question.

11. S. W. by W. 123° 45′. مغيب الاكليل, the setting of *Akleil*, the crown. There are several constellations so named. *Corona borealis* is called الفكة, and is much too far north. There is another *akleil* (*janúbí*) the southern crown, situated about azim. 130° which is nearer the mark: but the constellation intended may possibly be الاكليل العقرب, the crown of the scorpion, the 17th lunar mansion of Ulugh Beg; notwithstanding its error of azimuth. In position, the bright star Fomalhaut (فم الحوت) of Pisces Australis comes much nearer the mark, (121°) and it seems curious that it should have been set aside for a less conspicuous group.

12. S. W. 135°. مغيب عقرب, the setting of *áqrab*, the Scorpion. We shall see presently that *antares* is the star of this constellation here intended, although it is far too northerly for the position. But for such confirmation we might have suspected *áqrab* to be a corruption of الغراب *alghoráb*: the crow (κοραξ) which lies in 134° azimuth.

13. S. W. by S. 146° 15′. مغيب حمارين, the setting of *Hamárein* the two asses. This name is not to be found in the globe. The nearest to it in situation are α and β Gruis.

14. S. S. W. 157° 30′. مغيب سهيل, the setting of *Soheil*, the well-known star Canopus in the constellation Argo, *Alsafinah* of the Arabs. The north polar distance of this star, however, is only $143\frac{1}{2}$ in lieu of $157\frac{1}{2}$. It would set in azimuth $157\frac{1}{2}$ at a place situated in north latitude 28°; so that if this be taken as a clue, we may trace the origin of the compass scheme to *Lower Egypt* or *Syria*.

15. S. by W. 168° 45. مغيب سلبار, the setting of *salibár*. As we proceed southwards it becomes more and more difficult to find the stars intended. Canopus indeed is almost the only one familiar to us. *Salibár* is not to be found on the globe, nor in the dictionaries: but it is the very word translated *Lyra* by the Baron Hammer, a northern constellation, which would be quite inadmissible in the southernmost situation of the compass. There is a constellation somewhat similar in sound on the brass globe described by Dr. Dorn, called السبع *Alsabá*, the beast, lying close to the Centaur with which its stars are mixed.—Again, should α Centauri be the star intended, it would be about the right distance in azimuth from Canopus—but this star is called

with its fellow in the other leg of the Centaur, حضار والوزن *Hazár-o-ulwazn* on the globe. The only other star of note falling within moderate limit of distance is α Eridani, or *Achernar* of our globe, which is a corruption of اخرالنهر *akhir-ulnehr*, 'the end of the river.'—Whatever star may be meant by *salibár*, it is surely more southerly than Canopus, and by no means Lyra. The two or three translated passages from the *Mohit* equally confirm this, and receive illustration from it. In the voyage to *Gujerát* (page 456) the translation says—"In this measure (the *kiás*, or lat. 16° 54′ north) Lyra *(salibár)* is five inches (13° 30′), or Sagitta (*sahm awal*) six inches (15° 6′), or Canopus and Lyra are equal to three inches and a half (11° 6′)." The second paragraph in page 457 is expressed almost in the same words. Now if for السهم *ul sahm* be read النهر *ul nahr* (α Eridani), and for *salibár* we take η Argonavis, the above conditions may very nearly be complied with; for, in north latitude 17°, Canopus and η Argo will be seen at an altitude of 12° together, on opposite sides of the south pole at the hour of 10 p. m. in the beginning of March. The north polar distance of α Centauri (150°) would better suit the given meridional elevation (13° 30′) than that of Argonavis: but in this case it must be *alnahr* and not *salibár* which must be coupled with Canopus at the equal altitude 11° 6′: and the text would need a second alteration.

Again, in page 456 (the latitude by position being about 18°) the translation says—"If it be not time for taking the polar star, take the height at the setting of Aquila (*nasr-wáqá*) by the Lyra (*salibár*) which gives 7½ inches (or 17° 30′)." Now first correcting *vega*, which we know to be α Lyræ, and not *Aquila*, we shall find that at his setting, the star above pointed out as *akhir-ulnehr*, Achernar, comes to the southern meridian, and bears very nearly the altitude required.

Here then *salibár* would seem to be α Eridani, whereas in the other two cases it may be η Argo. Until we get somebody to point out the actual star in the heavens, it will be impossible to decide between the two; but a considerable step towards the solution of the *Mohit* problem has, at any rate, been made by the discovery that *salibár* belongs to the southern hemisphere.

If the Baron will favor us with a translation of the first chapter which treats of the names of the stars, the division of the circle of the skies, and, above all, of the cardinal points of the compass, we shall doubtless be able to clear up all these points in a satisfactory manner.

The navigators of the Maldive islands follow the Arabs in their division of the compass which they call *samaqá* اسمقا a name apparently

taken from the *Malabar* word, *samoukká*, for which M. KLAPROTH is at a loss to discover the origin*, though it seems obviously a corruption of the Sanscrit term चुम्बक *chumbaka*, the loadstone. The Maldivís alter a few of the names, particularly towards the south. Some of these variations serve to throw light upon the doubtful parts of the Arabic list. The orthography also, as written in my presence by my intelligent friend MUHAMMAD, better known among his island countrymen as *Ustád-muallim*, the master-pilot, differs considerably, being more of the Malay style: one letter an ع with a dot under it, is, he tells me, peculiar to his islands: it has the pronunciation of *gh*, not of غ, while ق is pronounced more like *g*. The following is his catalogue:

عو pronounced *ghao*, the north pole—of unknown derivation.

فرعديم *farghadèm*, a corruption of *farkadain*.

ناس *násh*, the *alif* substituted for *ain*.

ايوق *áyouk*, ditto.

قاسل *gásil*, used for α Lyræ in lieu of *wáqá* or Wega.

سماق *simág*, the ق used for ک.

تريان *therián*, a corruption from *suraya*.

مرع *murgh*, the west—derivation unknown, perhaps corrupted from *maghib*,—*irua* is the east.

جوزا *jozá*, the star Rigel.

تير *tír*. Can this be Sirius, which is the next conspicuous star more southerly than *Rigel?* Its Arabic name is الشعري.

اقرب *agrab*, in lieu of *akleil*, shewing that the crown intended is the *akleil ul áqrab* of the globe, which consists, according to ULUGH BEG, of β, δ, η and γ of Scorpio; β has a N. P. D. of 112° only, which would give an azimuth of 115° in latitude 28° north.

قلب *galb*. If this be correct in orthography, it would denote قلب العقرب *qalb ul áqrab*, the scorpion's heart, or Antares: but if intended for كلب the dog, it may stand for Sirius. The former is, however, most probable, because it confirms the Arabic name for the same point which is عقرب, or simply the scorpion, of which the principal star is Antares.

حماريم *hamárím*, the final *m* substituted for *n*.

سل *sil*, pronounced *silli*, an unknown substitute for *soheil*, which will be seen to be removed further south; perhaps it is the local name of Canopus, corrupted from the Arabic.

* KLAPROTH sur l'invention de la boussole, p. 32.

سلوار *siliwár*, the *w* substituted for *b*.

سهيل *soheil*, Canopus, is used by the Maldive sailors as the south cardinal point,—for what reason I was unable to discover. They also use the Indian word *dakhan*.

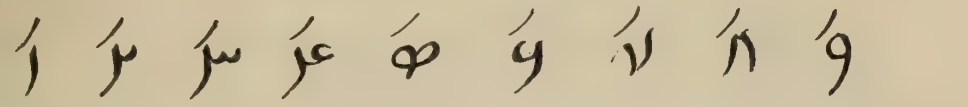
Note on the Maldive Alphabet.

While conversing with the *Ustád-muallim* one day on the above subject, I got him to write down the names as seen above in the Arabic character: being curious, however, about the modification of the ع *ain* introduced, I inquired whether the Maldive population had any distinct alphabet of their own, to which he replied in the affirmative, and gave it me in writing just as I have lithographed it in Plate XLIX—a most whimsical system, and calculated to puzzle antiquarians egregiously should they chance to stumble upon an inscription in the Maldives without possessing the key to it!

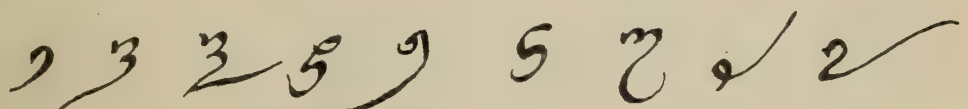
At first he told me they had but nine letters, (the second row in the plate,) *m, ph, d, t, l, g, n, s, d*; but on my observing that he made use of a letter not in this list for the *k* of *Calcutta*, he said—"Oh yes, there are the other nine" (the upper row)—meaning, as I presumed, that they were not indigenous but extraneous signs introduced to express foreign sounds: they are, in fact, the nine Arabic numerals with a dash above them to distinguish them from the ciphers. He wrote with greater fluency in these his native characters than in the Arabic.

The system of vowel marks is partly an imitation of the Arabic and partly of the Indian method; the long vowels being denoted by doubling the diacritical stroke: the nasal *n* is marked like the Sanscrit *anuswara*, but the letter م is also inserted. It was striking to observe how readily his ear distinguished the sound of a diphthong, and how correctly he expressed it with a double character. The order of writing is from left to right, contrary to the Arabic mode, and none of the letters admit of being joined together or abbreviated; but I pretend to no more knowledge of the alphabet, or language, than is comprehended in the plate itself, and need not, therefore, attempt to expand the materials of a short interview between two parties but imperfectly understanding one another, into a treatise on the unknown and, perchance, non-existent literature of these simple islanders.—It will, doubtless, surprise many that they should have arrived at all at the possession of an alphabet of their own. Among the specimens in the plate I have introduced the names of the cardinal points as given above.

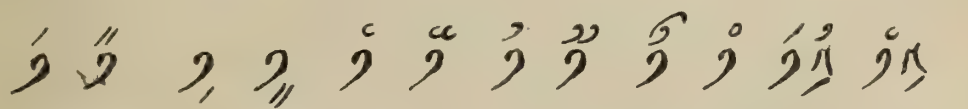
Maldive Alphabet.



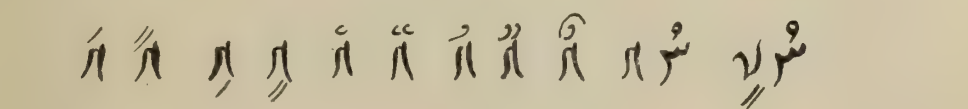
ha tha ña ra ba la ka á wa



ma pha dha ta la ga na sa ḍa



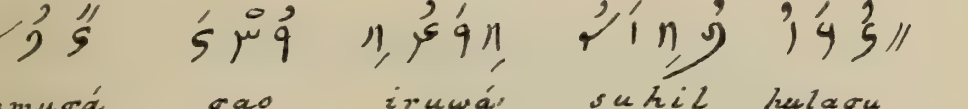
ma má mi mí me mè mu mú mo m̃ mau mai



a á i í e è u ú o aṁ kíṁ



Máhaldíb Kalkatá Sítigam (or Chittagong)



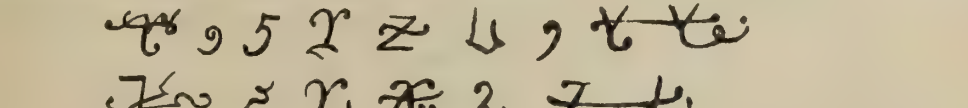
Samugá gao (gaňw) iruwá suhil hulagu

compass north east south west

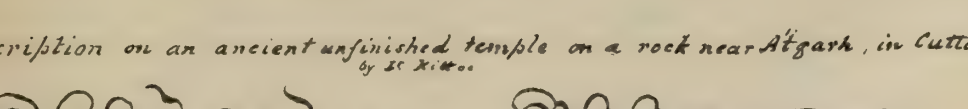


odi (a ship) dhoní (a sloop)

Inscription on a Cannon at Lisbon, (sent thither from Goa), in sanscrit letters.



Inscription on an ancient unfinished temple on a rock near Átgarh, in Cuttack.
by Lt Kittoe



Skinner lith.

Printed at the oriental Lith. Press

VII.—*Facsimiles of Ancient Inscriptions, lithographed.*

(Continued from page 731.)

Inscription on a Cannon from Goa.

At the foot of Plate XLIX. I have inserted the copy of an inscription which, it seems has long puzzled the savans of *Lisbon*. Mr. J. Gaudart, chief interpreter and sworn translator to the British Government at Penang, Singapur, and Malacca, has addressed the Rev. Anselmo Yegros, Vicar General of the Singapur Mission, on the subject, affording, as he conceives, a full explanation of its purport; but either the characters must be exceedingly perverted in the copy, or Mr. Gaudart must have a powerful imagination, to convert, as he does, such hieroglyphics into the following Sanscrit sentence:

श्रीच भाण्ड उत्तम राज राम
स्वकीय १२ मेष ७२८

which he translates, "(cette) heureux (et) puissant manufacture appartient au bon Roi Rám le 12 de Bélier 728."

The rája here designated as the proprietor of the gun (if the reading be conceded) the translator explains to be *Ráma varma vira Martanda Perumal Tamuri*, who reigned at *Calicut* from the year 718, (A. D. 1542,) to 736 (A. D. 1561,) of the Parasuráma cycle. He was engaged in severe struggles with the Portuguese, and it is probable that the piece of ordnance thus fell into the hands of his enemies.

Of the letters themselves those only that bear resemblance to old Sanscrit, are the 1st, 3rd, and 4th. The rest appear purely conjectural.

Inscription at Kandharpur.

Lieutenant Kittoe, already well known to my readers for his antiquarian and architectural zeal, has, on his recent march with his regiment towards *Gumsur*, taken every opportunity of examining objects of antiquity in his route. The only inscription he has yet met with is shewn at the foot of Pl. XLIX. "It is (he writes from *Cuttack*) contained in two compartments of a very ancient and unfinished temple on a rock in an island near *Atgarh*; at a place called *Kandharpur* or *Kandalpur*." The characters are of the old Bengálí or Gaur type: and may be thus transcribed in modern Deva Nágarí; श्रीविचित्रश्वरदेवः श्रीविचित्र भूषणः: "the divine lord of beauteous variety, the variegated ornament"—being the epithet, doubtless, given to the form of Siva, established or intended to be *sthápan'd* in the temple.

VIII.—*Description of* Uch-Shari'f. *By Munshí* Mohan Lál.

[Dated Sít Pun, on the joint streams of the Panjáb.]

Uch, surnamed *Uch-Sharíf*, or holy *Uch*, which being near the junction of the united streams Hesudrus, Hyphasis, and Hydraotes, Acesines, and Hydaspes, attracts the notice of geographers, contains numerous sepulchres of the Muhammadan saints. The oldest of all is that of Sháh Sáif ul Háqqárí, but it dwindles into obscurity. A miserable wall without the roof environs the dust of the above saint.

If I write the respective names of the saints of *Uch*, along with their incredible miracles, I fear to enlarge my remarks: however, I presume to lay before you the endeavors of my feeble pen in regard to Sháh Síad Jalál and his reputed descendants. He died 600 years ago, and is said to have lived to the age of 150. His tomb, which is inside a large but gloomy room, is elevated about five spans from the surface of the ground. It is a very simple building, adorned with the poor frail and old canopy. Both of his sides have ten graves of his offspring. They are distinguished by one rising above the other, which fill the entire position of the room. None of them have any kind of inscription.

Sháh Síad Jalál acquired a very great fame by defeating the Halássu', and converting his son Boláqu' into Islámism. He was the ruler of *Betáwahí*, near *Baháwalpur*.

Jalál had three sons, Ahmad Kabír, Bahá uddín, and Síad Muhammad. When the first of the three was about ten years old, he happened to meet a man in the bazár, whose son had died of some disease. He applied to Ahmad Kabír to restore his dead son to life. The young saint, after making ablution, turned his face towards *Mecca*, and repeated the words "Qum bi izn Alláh*," which literally means, Get up by the command of God.

Such is the wonderful miracle described of Ahmad Kabír. When he grew older, he became the father of the two reputed sons, Síad Jalál uddín and Síad Muhammad Ráju'. The former was called by the name of Makhdu'm Jahaníán Jahán Gasht, (or the traveller and the Lord of all beings;) and the latter, Ráju' Qattál, (or the Rájú slayer.) Numerous miracles were wrought by these two brothers. They went to pilgrimage through *Persia*, &c. &c. &c., marrying a great number of wives, and leaving children in every country, which, tradition says, amounted to 12,000; but I doubt the authenticity of the information.

* The power of raising the dead by saying the above mentioned word, I hitherto knew was only peculiar to Jesus Christ.

When the MAKHDU'M reached *Madínà* he was suspected to be a common Musalmán and not a Síad. On this he stood out of the door, and, looking at the tomb of MUHAMMAD, cried as follows: "*Assalám alaikiki yá jaddí*" (or, Peace be with you, O grandfather); when came the answer "*Va alaiki ussalám yá valdí,*" (or, Peace be with you, O son) out of MUHAMMAD's tomb, which convinced the men of the shrine that he was a real Síad. People assert that this proves his being the respected and first saint of the Musalmáns. On receiving the intelligence, I desired to visit the monument of such a renowned holy man of *Uch*.

In company with my countryman and school-fellow, Pandit KÁSHÍNÁTH, we proceeded to the town of *Uch*, and passed through a few narrow streets on our way to the shrine.

On coming to the door, which has dwindled into the most ruinous state, we descended towards the west, and turning to the south entered the room where the body of the MAKHDU'M rests. The tomb is a very poor structure, but raised about seven feet high from the ground, which is concealed by numerous other graves. There is nothing admirable in the shrine of the MAKHDU'M. Three small openings give light inside the apartment.

The following Persian inscription written on the door, presents us with the date of the MAKHDU'M's death.

تاریك گشت جمله جهان بیجمال شاه تاریخ بود هفتصد و هشتاد و پنج سال

"Tárìk gasht jumlah jahán be jamál Sháh,
Tárikh búd haft sad o hashtád o panj sál."

When the world was covered by darkness without the countenance of the Sháh, (or Makhdúm.) The date was 785 of the Hijrí era.

The mausoleum of MAKHDU'M JAHÁNÍÁN JAHÁN GASHT is annually visited by the pilgrims of the distant country. It is a popular belief in this region, that a fool can get restored to perfect sense by eating the earth of this tomb.

It is very odd that the tombs of the saints of the holy *Uch*, who possessed such boundless reputation and respect in days of old, have been not adorned with any kind of architectural beauty, either by their posterity or believers, except that of "Bíbí Jind Vadí," (or the lady of the long life.) It is situate on the verge of a precipice which commands the old bed of the *Panjáb* rivers, and gives a romantic view.

The southern part of this magnificent sepulchre has been unfortunately swept away by the late inundation of the above streams.

Besides this, it suffers a good deal by the neglect of the Musalmáns, who do not repair it. The door, which has been entirely eaten by worms, opens towards the east, and has a sight of the other two cupolas. They excel in material and handsomeness the others of *Uch*, except that of "Bíbí Jind Vadí."

"Bíbí Jind Vadí" was one of the descendants of Sháh Síad Jalál, of whom I have already spoken. The dome in which she sleeps is erected of burnt bricks, which are cemented by mortar. The whole of the edifice is ornamented by various hues and lapis lazuli of the celebrated mines of *Badakhshán*. The size of this grand building may be estimated at about 50 feet high, and the circumference 25.

Though the clouds had unluckily obscured the light of the day, still we endeavoured to take a sketch of the Bíbí Jind Vadí's mausoleum by means of the camera obscura. I herewith enclose a copy of it—[which we omit for reasons given on a formar occasion.—Ed.]

IX.—*Specimens of the Soil and Salt from the Sámar, or Sambhur lake salt-works. Collected by Lieut.* Arthur Conolly, *and analyzed by Mr.* J. Stephenson.

It is now more than a year since I received from my friend Lieut. A. Conolly the specimens named at the head of this article. They were on a very large scale, and packed up so carefully as to exhibit on arrival, almost as perfect a picture of the process and progress of the salt manufacture at the celebrated lakes of *Sámar*, as could be obtained by a personal visit to the spot.

At my request, Mr. Stephenson submitted such of the specimens as seemed to require it, to chemical examination in my laboratory, and where the results were unexpected, I verified them myself by re-examination. My sole reason for delaying the publication of these very interesting memoranda was, that I was in hopes Lieut. Conolly would favor me with a full account of the manufacture, which, however, public business and subsequently ill health obliged him to postpone—and thus time has crept on until the specimens themselves have nearly dissolved away in the damp air of the last rains; and unless I place on record what I already possess, there will hereafter be no means of consulting the perishable materials to prepare another report.

The labels which accompanied the parcel were so full and explicit, that, when followed by the chemical notes referring to the numbered specimens, they formed nearly as comprehensive a view of the opera-

tion as could be wished: I will therefore first place these before the reader.

Note on Sámar lake salt and earth, by Lieut. A. Conolly.

While acting as Salt Collector for two months at *Sambhur*, I employed part of my time in putting together officially some interesting notes, historical (semi-fabulous rather) and statistical, concerning this marvellous spot, collected by my friend N. B. Edmonstone, Esq. Superintendent of *Ajmír*, when he went to take possession for the Honorable Company at the beginning of the year (1835). Connected therewith it would be desirable to have scientific examination of the produce of the mines, for which purpose I send them to you under charge of a servant; and will here detail the contents of the boxes.

A 1.—A long box containing a quantity of the mud which forms the bed of *Sambhur* lake, and which yields as often as it is covered by (a few inches depth of) water, and acted upon by a hot atmosphere. This mud was dug out before me from the bed of a "*kiyár*" (or vat) just after it had yielded a good crust of salt crystals, when it was of the consistency of a stiff jelly. The mud nearest to the surface was put next to the part of the box at which the lid is laid hold of, (in order that it may be drawn out,) and so on downwards till the box was filled.

A 2.—A box divided into three parts, containing as many sorts of earth. 1st. Some of the black mud just mentioned, which has the depth of about half a *gaz* below the surface of the lake. 2nd. A bluish earth which soon hardens into a friable cake and seems a compound of what lies above and below it. This has a depth of half a *gaz* under the black mud. 3rd. A white sandy earth, which has a depth of from five to six *gaz* under the second strata. This I learned from the *Sambhur* Sherishtahdar who sent the specimens after me to *Jaipúr* on the 10th July. He wrote "under strata No. 3 lies white stone from which chunam is made." I immediately sent off an express to say that I would make the fortune of any enterprising digger who would dive for some of this stone, but the Serishtahdar returned for answer that the attempt had been made in vain, (rain) water having covered the whole surface of the marsh. He dug on the very edge of the lake, where there was no black mud, but only the earth No. 2, and he found nothing but this (he wrote) to the depth of 6 *gaz*, when the influx of water obliged the diggers to give over work. He wrote moreover, some of the "oldest inhabitants say that all parts of the lake are not alike; that in some places you dig and find the three sorts of earth sent; in others, below the mud only '*sang i kuchet*' (?) In others again only mud that has no bottom."

I may further mention that the Serishtahdar wrote—"The people call the *gil i safeid*, *Pindole* (H.) and make whitewash from it." This inducing a belief that it contained lime, I poured vinegar on a bit which immediately effervesced. I fancy this sort of earth is used to make the very delicate porous vessels out of which the better sort of natives drink in summer.

A 3.—Three pieces from the surface of a *kiyár* (vat) off which a crop (crust) of salt had just been raked.

4. A piece of ditto, on which, apparently, the salt did not come out well.

5. A piece of ditto, near the edge on which the salt did not form.

6. A piece of ditto, the salt of which got mixed with scum while forming.

7. A piece which seems to have been similarly mixed, but which was cut from another *kiyár*, and said to be five or six years old. It has evidently been rained upon, and it was taken from under a sheet of rain water, by which more of it would have been melted had it not been old and *pakká*.

8 a.—A piece on the scum of which crystals were formed after rain had fallen upon it.

8 b.—A ditto ditto.

8 c.—A ditto ditto.

9. A piece the salt of which got somewhat mixed with mud when being formed, (probably from its being agitated by a strong wind) and on which a crust of scum settled.

10. A piece of crust, chiefly scum, such as is thrown aside as useless.

11. Other refuse pieces taken from a kiyár in which they had been lying neglected for, perhaps, some years.

12. Pieces of crust of *salt* from the surface of a kiyár.

13. Ditto ditto. N. B. These have been more or less smoothed and thinned by having been rained upon.

14. Bits of a fine crust of salt with a little scum on the top. This was cut with a phaurá from the surface of a kiyár.

14 a. Three other bits of a different kiyár.

14 b. Another of another.

The above five items are merely varieties to enable you to trace the process of formation.

A 15.—"*Bacheh*," or infant crystals, about the smallest size in which the mineral particles come to view on the surface of the salt mud, after the partial evaporation of a body of water covering it. These were taken from under a sheet of water six fingers (or three inches) deep.

16. Crystals about two days old (after first formation) six fingers' depth of water at first, 1½ fingers' depth evaporated when crystals taken out.

17. Ditto about three days old; or when two of six fingers' depth of water had evaporated.

18. Ditto about four days after first formation, or when three of six fingers' water had evaporated.

19. Ditto of a fair (common) size, produced after about eight days' evaporation of six fingers deep water.—N. B. These crystals were found during the hot winds, when the day's heat was intense, and that of the night considerable.

20. Crystals which formed on a stick after it had lain seven days in the six finger water from which the last mentioned (19) were taken after eight days.

21. Ditto. The concretion is more rapid on a thread, or stick, or any thing that the water can get round, than on the surface of the mud.

22. Crystals made in a kiyár in 20 days during the hottest season. 12 fingers' depth of water at first, four remaining when crystals were taken out.

23. Crystals taken from the lake after a complete and uninterrupted evaporation of a body of water five or six, or perhaps more, inches deep.

24. Pink crystals from the surface of the marsh; formed by the rapid evaporation of a shallow deposit (or *puddle*) of water.

A 25.—Good *Sambhur* salt, such as a *byopárí* would call *pakká*, and readily buy.

26. Superior ditto, such as a *byopárí* would *covet*—a year or so old.

B 1.—" The grandfather of all salt" (the literal expression of the man who brought it.) A lump taken out of an old pit eight cubits deep, said to have been re-opened after a lapse of 100 years. In this may be observed several layers, but for which I should have been ready to believe that the diggers had arrived at the top of an under ground chain of salt mountains, such as those beyond the Indus, which ELPHINSTONE describes, and that they had just chipped off a peak. You must know that the bed of the *Sambhur* lake is, for the most part, as shallow as a dish, and that after the rains it gradually becomes dry; *when* dry the natives dig pits a few cubits' depth in the bed of the marsh, and pour the salt water that they thus obtain into vats (made with large stakes, grass, and earth), in which it evaporates in from eight to fifteen days, according to the depth of its sheet, and the state of the weather. A pit is dug for a few rupees, so an old one is not usually restored after the rains: the water deposited in it dries into a cake of salt at its bottom; then a little sand is blown in, and then another rainy season comes, and a second layer is formed, and so on for perhaps many seasons, when, the pit becoming filled, all traces of its contents disappear till the sinker of a fresh well hits upon them.

2. Another lump taken out of another pit three or four cubits deep.

B 3.—Another from another.

4. Another bit from another pit.—N. B. All four specimens were extracted when water was above them.

5, 6, 7. Lump crystals and intermediate strata of earth from other pits.

8 and 9. Loose crystals from a pit four cubits deep.—Ditto from ditto, eight cubits deep.—N. B. You will observe that nearly all the *Sambhur* salt crystals grow into the shape of a four-sided pyramid. I see in the Cyclopedia that the cube is given as the ascertained primitive form of 11 minerals, of which salt is one; please to *dissect* a crystal till you arrive at its nucleus, and if you have leisure, tell me the process of structure, for " *Sakamberí jí*," the tutelary goddess of the Chouhan Rajpúts, for one of whom she in the year 608 S. miraculously made the lake, appears to reverse the order of architecture in putting together her mineral particles, causing them to rise from a point to a base*.

10. A piece from a pit, the crystals of which are slightly coloured.

Examination of selected Specimens from the above. By J. STEPHENSON.

A No. 1.—*Mud from the bed of Sambhur Lake.*

An average portion digested in distilled water, and the filtered solution (which appeared of a reddish brown colour), subjected to the usual tests, gave the following results.

Nitrate of barytes,	Copious white precipitate.
Nitrate of silver,	Ditto flambent grey ditto.
Prussiate of potash,	No change.
Oxalate of ammonia,	Ditto ditto.
Litmus paper,	Ditto ditto.
Turmeric ditto,	Ditto ditto.

* The pyramidal appearance is merely from truncation of the cube. The solid angle of the cube seems to resist solution more than the rest of the crystal.—ED.

300 grains exposed to a gentle heat in order to drive off the moisture lost 107 = 35, 6 per cent.

100 grains of the dry mud was now put into solution, and the insoluble matter collected on the filter, washed, dried, and weighed, gave 70 grains.

The filtered solution treated with nitrate of barytes threw down a precipitate of sulphate of barytes, together with the colouring matter, which after washing, drying, and weighing, gave 17 grains = 10.4 sulphate of soda.

The solution now freed from the sulphate was next treated with nitrate of silver, from which a precipitate of muriate of silver was obtained, weighing 42 grains = 19.5 muriate of soda.

Insoluble matter,	70	0
Sulphate of soda,	10	4
Muriate of soda,	19	5
Loss,	0	1
	100	0

Examination of the insoluble matter from A No. 1, after the separation, as above, of the sulphates and muriates.

Fifty grains of the insoluble earthy matter now freed from the extraneous salts was treated with muriatic acid. A strong effervescence took place, and the digestion was continued for 12 hours, as there was reason to suppose that carbonate of lime was present. It was now repeatedly washed with pure water, and the remaining earthy matter, which the acid had not dissolved, separated and collected on the filter, well dried and weighed: it amounted to 37 grains.

The muriatic solution was now treated with oxalate of ammonia, which threw down a copious precipitate of oxalate of lime. This being well washed, and dried, weighed 11 grains = 8.6 carbonate of lime.

The remaining solution contained a considerable portion of loose muriatic acid, which being neutralized with pure liquid ammonia, a portion of alumina (tinged with yellow oxide of iron) was precipitated. This being separated by the filter, washed, dried, and weighed, gave 4 grains.

Calculating then for per centage, the composition of this earthy matter will stand as follows:

Matter insoluble in muriatic acid (silica,)	74	0
Carbonate of lime,	17	2
Alumina and oxide of iron,	8	0
Loss,	0	8
	100	0

A No. 10.—This I found to be chiefly composed of sulphate of soda, with the carbonate and muriate of soda in considerable proportion.

A No. 15.—This gave a trace of sulphate; otherwise good salt; though the crystals are small.

A No. 22.—When tasted gave traces of sulphate.

A No. 24.—Crystals of a pink colour, which disappear in the filtered solution; the colouring matter appears to be volatile—sulphate of soda predominates in this sample; no carbonate of soda present.

B No. 1, *from an old deep pit re-opened after* 100 *years. Examination by tests.*

Nitrate of silver,	Copious precipitate.
Nitrate of barytes,	Very copious ditto.
Oxalate of ammonia,	No change.
Prussiate of potash,	Ditto ditto.
Litmus paper,	Ditto ditto.
Turmeric ditto,	Ditto ditto.

A fair average sample was taken through the whole thickness of the lump.

100 grains exposed to a gentle heat lost 5.5 grains moisture.

100 grains treated with nitrate of barytes gave a precipitate, which after having been well washed and dried, weighed 136 = 83 sulphate of soda.

The filtered solution treated with nitrate of silver produced a precipitate of chloride of silver, which after having been well washed and dried, weighed 22 grains = 10.4 muriate of soda.

The composition of this sample is then as follows:

Insoluble matter,	1	0
Moisture,	5	5
Sulphate of soda, (and carbonate?)	83	0
Muriate of soda,	10	4
Loss,	0	1
	100	0

A No. 6.—The salt of which got mixed with scum while forming, appeared very wet.

When tested, this sample appeared to contain a considerable portion of alkali, especially the reddish coloured part called *scum* in the list.

100 grains dissolved, and the insoluble matter separated by the filter, washed and dried, gave 2 grains.

To the filtered solution was added acetic acid till the alkali became neutralized; after which it was treated with nitrate of barytes; the sulphate of barytes was precipitated, and having been well washed and dried, weighed 84 grains = 51 sulphate of soda.

Nitrate of silver threw down a precipitate of chloride of silver that weighed (after washing and drying) 30 grains = 14 muriate of soda.

In order to ascertain the quantity of alkali in this sample, 100 grains were dissolved in pure water, and treated (drop by drop) with sulphuric acid of specific gravity 1.116 till the exact point of saturation was ascertained, by frequently testing with litmus paper. Towards the point of saturation a strong effervescence took place. The solution was neutralized after 96 grains of the acid test liquor had been used, which is equal to 10 per cent. of carbonate of soda.

This sample being very wet, the moisture was ascertained in the usual way, and amounted to 23 per cent.

This sample, or rather what is called *scum* in the list, is composed of

Sulphate of soda,	51	0
Muriate of soda,	14	0
Carbonate of soda,	10	0
Insoluble matter,	2	0
Moisture,	23	0
	100	0

Samples A Nos. 25 and 26, called good and superior salt in the list, when tested, gave traces of sulphate; with this exception the crystals are good and pure.

The conclusions to be drawn from the preceding details are somewhat at variance with the general impression regarding the *Sambhur* salt lakes. At least my own idea, derived from conversation with natives engaged in the salt traffic, was, that the lake water was a deep saturated brine, which left so thick a cake of salt on evaporation in the hot weather, that it was cut out in blocks on the margin and brought away on bullocks.

It would seem, however, that the shallow lake, or inundation would of itself, leave a deposit too thin to be profitably worked; and that it is customary to dig reservoirs or *kiyárs* wherein several feet depth of water already nearly concentrated to brine, are allowed to deposit their crystals on drying; or the evaporation is aided by the introduction of sticks, up which the saline incrustation rapidly creeps.

The velocity of the spontaneous evaporation under the fierce sun and scorching winds of the western desert, is well exemplified by specimens A 15, the *bacheh* or infant crystals of one day's growth, through 16, 17, 18, to 19, the 8th day's produce; in the last the crystals are cubes of full half an inch base. Again we find crystals of the same size in No. 22, from the evaporation of 8 out of 12 fingers' depth of water in 20 days of the hottest season. In No. 23 the crystals from 6 inches depth of water are of $\frac{3}{4}$ inch base. The *size*, however, of the crystals depends greatly upon the undisturbed continuation of the process, and does not give us a clue to the quantity of salt deposited from a given depth of water, whence we might calculate the saltness of the lake itself at various periods of the season. The rate of evaporation itself may be estimated from the above data tolerably well; thus—"6 fingers in 8 days"—"12 fingers in 20 days"—will be nearly *half an inch in depth per diem!* The pits dug for the reception of the brine seem sometimes to be very deep, 10 or 12 feet; in these when deserted the deposit proceeds for several years, forming solid strata of salt separated by a streak of earth washed in during the rainy season. The accumulation is then dug out in mass: but in general the salt for sale is collected as it forms in the brine pits in a granular state, by which means it is freed from the more soluble salts with which it is accompanied. The *pakká* salt of the *byopáris* or traders (Nos. 25, 26), is of a large grain—the latter indeed in half-inch crystals,—and not very clean.

A circumstance of chief importance elicited by Lieut. Conolly's specimens, is the presence of the carbonate and sulphate of soda in considerable abundance among the saline products of the *Sambhur* lake. The greater part of the substance described by the manufacturers as *refuse* or scum, which is stated to be thrown away as useless, turns out on analysis to be carbonate of soda, contaminated with sulphate and muriate; and it is well deserving of inquiry, whether the discovery of so extensive a store of *natron* in a state of great purity, may not be turned to profitable account. In all the strata cut from the neglected *kiyárs* the carbonate is seen overlying the mixed sulphate and muriate, of an efflorescent snowy consistence. Sometimes the formation of the salt is prevented by its abundance as (in A 4, 5, 6); No. 5, I find on analysis to contain 40 per cent. of carbonate, with 30 of each of the other salts—and a little care in separating the crystals of these would leave it nearly pure.

Spicular crystals resembling nitre are seen in some of the specimens (A 11); they bear a very small proportion to the general mass. It is but necessary to refer to Mr. Stephenson's examination of other specimens, to form a clear idea of the conditions best suited for the separation and collection of the different salts; thus in the old deserted pits (B No. 1), the sulphate is obtained nearly pure: in A 6, 10, it is mixed with carbonate; in A 5, the latter predominates. As for the muriate, from its inferior solubility, this salt is readily separated in a state of purity from the brine.

The small proportion of lime in the earthy residue of A 1, from the bed of the lake, rather militates against the expectation entertained by Lieutenant Conolly from native report, of a subjacent stratum of this mineral.

The points now wanted to complete Lieutenant Conolly's description of the *Sambhur* salt manufacture, and the questions naturally induced from the information he has already given, are:

1. A topographical account of the lakes, their extent, general depth, position relatively to adjacent plains, sands, or hills.

2. The extent of the manufacture, produce, possible increase, price, and other statistical data.

3. Whether the carbonate and sulphate are worked and used? the quantity and price of these.

4. The exact process followed by the native manufacturers or collectors.

5. The specific gravity of the water, both of the lake and of the brine pits, at different seasons; which may be found in the absence of the means of determining it on the spot, by bottling off a portion

at stated times. This would also enable us to ascertain whether the carbonate existed in the water, or whether it was formed during the evaporation, by the action of the lime or other earths. The presence of magnesia, of potash, and of iodine also remains an undecided point, as well as the nature of the pink or amethystine colouring matter remarked in some of the specimens (A No. 24).

To conclude this hasty note, I may mention that I have found M. Gay Lussac's alkalimeter a very convenient instrument for examining these mixed salts. By preparing three standard bottles of dilute nitric acid, nitrate of barytes, and nitrate of silver, adapted to his centesimally-divided dropping glass, the per centage of carbonate, sulphate, and muriate, is obtained successively from the same specimen with great ease and rapidity.

J. P.

X.—*Remarks on a collection of Plants, made at Sadiyá, Upper Assam, from April to September,* 1836. *By* William Griffith, *Assistant Surgeon, Madras Establishment, on duty in Upper Assam.*

The following remarks may not be uninteresting, as they concern a portion of India of which, especially so far as regards its natural productions, but little is known. I must beg, however, to point out that they must be considered as outlines only of a slight sketch; since the amount of plants collected in *Assam* does not probably exceed 1,500, and this can scarcely be considered more than one-fourth of its whole Flora.

The greater portion of *Assam* that I have seen, may be compared to an extensive plain, intersected in various manners by belts of jungle, the breadth of which, although extremely variable, does not, except towards the hills enclosing the valley, seem to be often very great. But as we approach towards the eastern boundary, the spots unoccupied by jungle become fewer and less spacious: so that between *Kujoo Ghat* on the *Noa Dehing*, and *Nungroo* on the *Booree Dehing*, and in the whole of that direction, the country is almost exclusively occupied by jungle. The characters of a plain intersected by narrow belts of jungle is very obvious about *Sadiyá*, at which place the collection was almost entirely formed.

The peculiar feature of *Assam*, especially its lower and central divisions, consists in the vegetation of its churs, or tracts of sand, very often of great extent, which are stretched along the *Burhampootur*. The breadth of these tracts, taken together, is, in some places, from 8

to 10 miles. They may be said to be throughout their whole extent exclusively clothed with dense grass jungle.

Up to *Rungpoor* the eye meets nothing but grasses, and an occasional Bombax, a tree remarkable for its ramification, the branches being nearly approximated in whorls, and forming right angles with the trunk. About *Buggooa Mookh* belts of jungle begin to appear, here and there approaching to the banks of the river. From this place upwards the belts increase in extent and number, and from *Seloni Mookh*, just below the confluence of the *Dihong* with the *Burhampootur* to *Sadiyá*, they proponderate much over the grassy tracts. Above *Sadiyá* these tracts recommence at least on the northern bank, but they disappear soon entirely: the grasses that clothe the churs are, especially throughout Lower and Central *Assam*, of gigantic size, some of them often measuring 20 feet in height. They consist of four or five species of Saccharum, the kuggra, mog, (white,) molaha, (red) and telee, (blackish,) of the Assamese, and a species of Arundo, which is perhaps the longest of all, the nul (or podomolee*) of the natives. Towards *Sadiyá*, however, very large tracts are covered with Imperata Cylindrica, the *ooloo-kher* of *Assam*, which grows to the height of 5 to 7 feet. As the genus Saccharum far preponderates over the others, and is perhaps during its inflorescence one of the most conspicuous genera of the order, the appearance presented by the churs during the flowering of their occupants, can be more easily conceived than described.

It may perhaps be convenient to consider the botany of *Assam* under the following heads.

I. Botany of the *Burhampootur*, including the churs.

Of these, Gramineæ form, as I have said, almost exclusively the Flora. Of the immediate banks, the predominant order is,—Compositæ, Polygoneæ, Scrophularineæ, Gramineæ, (among which is a species of Alopecurus,) Borragineæ, have several representatives: from *Jorháth* upwards to *Diboroo Mookh*, a large annual Ranunculus occurs extensively, and throughout the same distance large patches not uncommonly occur of a species of Irematodon, *(I. sabulosus, mihi,)* a species of Polentilla is also not uncommonly met with.

II. Botany of the plains.

Predominant plants, Gramineæ; of these the most common about *Sadiyá* are Imperata cylindrica, Saccharum spontaneum, Saccharum fuscum (Roxb.) in wet places, and a probably new, large and coarse species of Panicum. Among these may be found two or three Orchideæ, Polygoneæ, Leguminosæ, Cyperaceæ, one Viola, and a species of Exacum which is particularly conspicuous from its bright blue flowers.

* See Buchanan's *Dinájpur*, p. 168.—Ed.

Those parts of the plains which have at a previous period been cleared for cultivation, but are now unoccupied, present the usual tropical features; and are occupied chiefly by Cyperaceæ, among which occur one or two Gramineæ, several annual Scrophularineæ, and small Alismaceæ.

III. Botany of the belts of jungle.

IV. Botany of the foot of the boundary hills.

On this last I am not able to offer any remarks. It will be found excessively rich in ferns, and next to these perhaps in Cyrthandraceæ. The only opportunity that has hitherto been allowed me of visiting any portion of these boundaries above *Gawahatti*, occurred at *Gubroo Purbut;* and I was then fortunate enough to meet with an Alsophila 30 feet high, a Sollyana, (mihi,) and Kaulfussia Asamica. Of the third division, the botany is very varied; so much so, that no one prominent feature seems to present itself. It is to this section that by far the greater number of species contained in the collection will be found to belong; and I shall hence pass in review the orders composing it—reserving the few observations I have to make on the most interesting plants to a subsequent part of this paper.

To those orders, the presence of which indicates the climate of northern latitudes, or of a tropical one at considerable elevations, I have appended an asterisk; and to those which, though usually tropical, include plants which have hitherto only been found at comparatively high elevations, I have appended a cross.

Dicotyledones.

*Ranunculaceæ,	3	Dipterocarpeæ,	2
*Magnoliaceæ,	1	Tiliaceæ,	5
Anonaceæ,	6	Elæocarpeæ,	1
*Umbelliferæ,	7	Lythrarieæ,	1
Araliaceæ,	3	Meliaceæ,	8
Ampelideæ,	15	Aurantiaceæ,	7
Onagrariæ,	1	Rhamneæ,	5
Loranthaceæ,	1	Euphorbiaceæ,	15
Alangieæ,	1	Hippocrateaceæ,	1
Melastomaceæ,	5	Malpighiaceæ,	2
Memecyleæ,	2	*Conariæ,	1
Myrtaceæ,	4	Tranthoxyleæ,	5
Cucurbitaceæ,	12	Balsamineæ,	5
Begoniaceæ,	1	Casyophylleæ,	4
*Cruciferæ,	3	*Rosaceæ,	6
Capparideæ,	3	Leguminosæ,	41
*Violarieæ,	2	Connaraceæ,	2
Guttiferæ,	2	*Cupuliferæ,	2
*Temstræmiaceæ,	3	Urticeæ,	24
Sapindaceæ,	3	Artocarpeæ,	18
*Hippocastaneæ,	1	Stilagineæ,	2
Herculiaceæ,	1	*Chlorantheæ,	1
Bythneriaceæ,	1	*Saurureæ,	1
Malvaceæ,	4	Piperaceæ,	5

*Thymeleæ,	1	Acanthaceæ,	8
Proteaceæ,	1	Scrophularineæ,	20
Laurineæ,	6	Orobancheæ,	1
Amaranthaceæ,	5	Compositæ,	39
†Polygoneæ,	12	*Plantagineæ,	1
†Menispermeæ,	19	*Gentianeæ,	1
*Primulaceæ,	1	Apocyneæ,	8
Myrsineæ,	6	Asclepiadeæ,	9
Styraceæ,	3	Oleinæ,	5
Convolvulaceæ,	6	Jasmineæ,	2
Rubiaceæ,	36	*Borragineæ,	3
Lobeliaceæ,	1	Cordiaceæ,	1
*Campanulaceæ,	2	Ehreliaceæ,	4
*Sambuceæ,	1	Solaneæ,	6
*Viburneæ,	2	Gnetaceæ,	1
Cyrthandraceæ,	7	Incertæ sedis, including Roydsia,	31
Verbenaceæ,	11		
Labiatæ,	14	Total,	523

Monocotyledones.

Scitamineæ,	9	*Junceæ,	2
Canneæ,	1	Palmæ,	3
Hypoxideæ,	1	Tupistra,	1
Amaryllideæ,	1	†Butomeæ,	1
Hydrocharideæ,	1	Alismaceæ,	10
Arordeæ,	3	Eriocauloneæ,	1
†Smilaceæ,	7	Gramineæ,	37
Dioscoreiæ,	2	Cyperaceæ,	28
Ponledereæ,	2		
*Orchideæ,	15	Total,	126
Polamogeton,	1		

Acotyledones.

Equisetaceæ,	1	Filices‡,	34
Lycopodiaceæ,	5		
		Total,	40

Of *Anonaceæ* I shall only notice Sphorostemma, Blume. In this genus the connectivum is highly dilated, and the cells of the anther at a considerable distance from each other; and yet from the *arrangement* of the stamina, bilocular anthers with contiguous loculi result.

It affords another instance of the existence of the peculiar tissue, until lately supposed to be characteristic of Gymnospermæ. In addition to this singularity, its medulla is traversed longitudinally by bundles of dense, occasionally branched, woody fibre, which consists of a superposition or "emboitement" of several layers.

Cucurbitaceæ. Among these plants occur two genera which appear to be new, so far at least as the Prodromus of M. De Candolle is concerned; in which book the article on Cucurbitaceæ, (by M. Seringe,) appears to me to be very unsatisfactory. Of one of the above genera, I have only seen the male; it is remarkable for the involute, or rather gyrate involution of the petals. The second I propose calling Actinostemma: it is chiefly remarkable for the complete separation of its sta-

‡ Chiefly from the foot of the Abor Hills, on the *Dihong*.

mina; for the "dehiscentia circumcisa" of the fruit; and, above all, for the pendulous direction of the seeds. It approaches in some points to Zanonia. I am not aware whether the peculiar nature of the arillus of this order has been explained or not; it is a separation of that portion of the tissue originally surrounding and in close contact with the ovula. Hence it is a shut sac; and hence, too, it is wanting in Actinostemma, in which the cavity of the ovarium is not filled by a production from the placentæ.

Conariæ. In Conaria, of which I have one species from the Abor Hills, the raphe is certainly external with regard to the axis. I have not been able to ascertain whether this depends upon any torsion of the funiculus, which Mr. Brown has stated to be the case in other instances of a similar anomalous situation.

Of *Saurureæ* Houttuynia is the only example. This plant, which was originally described by Thunberg, appears latterly to have been more misunderstood than by the original describer. I have had no opportunity, however, of examining the work of Thunberg in which the plant is described. And I ought, perhaps, to except M. Meyer, who has published "De Houttuynia atque Saurureis," with which work I am unacquainted. I find each flower throughout the spike, except perhaps the terminal one, to be subtended by a very small bracte. Of these, the four lowermost, rarely only three, are highly developed and petaloid, forming the spatha.

The number of stamina to each flower is, excepting those at the apex of the spike, almost invariably three, and always equal to the carpella entering into the formation of the female organ; and of these the third is always next the axis. The terminal flower has from five to seven stamina; the space between this and the uppermost triandrous hermaphrodite (?) flowers is occupied by an assemblage of male flowers, with a variable number of stamina, but never greater than three, and usually, I think, two. That such is the structure of this portion is proved by the presence of bractea, similar to those of the lower portion, interspersed among the stamina. Dr. Wallich says, in Flora Indica, I. 362—"In the numerous spadices which I have examined, I have with Father Loureiro invariably found three staminas, and as many styles attached to each ovarium: the former above the base, the latter at the apex of its angles. I have not, therefore, hesitated continuing this most interesting plant in the very class and order where it has been placed in the Flora of Cochinchina. As there is no reason for considering it at all different from the original *Japan* plant, I am at a loss to account for the difficulty which the celebrated Chevalier Thunberg experienced in determining its

station in the sexual system; nor can there be at present any doubt of its neither belonging to Heptandria, Polyandria, or Monæcia." Thunberg was, however, so far as I can see, right; for he paid, in all probability, exclusive attention to the composition of the terminal flower, on which, in certain cases, the Linnæan rules lay much stress. Taking this into consideration, Houttuynia may be referred to Heptandria, Polyandria, or Monæcia; most correctly to the latter, and least correctly to Polyandria. But as,—so far at least as regards the Linnæan system,—the most obvious characters are the best, it is advisable to keep the plants still in Triandria Trigynia. The structure of the seed has been likewise totally mistaken. In the Flora Indica, loc. cit. the embryo is placed at the wrong end of the albumen, and is mistaken for the embryonary sac. The real embryo is a much more minute organ contained in this, "the vitellus," or membrane of the amnios of Mr. Brown. Dr. Hooker describes Dr. Wallich's account as most correct; but he does not define the situation of the embryo otherwise than by saying that it is situated at one end of the seed. Lastly, the plant does not belong to Aroideæ, nor even to Monocotyledones. Notwithstanding the apparent solidity of true embryo, yet the more important nature of the structure of the stem is sufficient to point out that it is Dicotyledonous, or rather Exogenous; and among these, its true place is, beyond doubt, Saurureæ.

Of *Thymeleæ* one species only occurs, which is apparently referrible to no published species of the order. To this I have attached the MSS. name of Jenkinsia, in compliment to Captain F. Jenkins, Agent to the Governor General on the North-East Frontier, to whom Botany, among other sciences, is considerably indebted.

Of *Menispermeæ* the majority are interesting. Cissampelos is the only genus with which I am acquainted, in which the ventral suture of the ovarium is anticous, or not next the axis. I am not certain whether the most correct way of understanding the curious structure of the female flowers is not to assume the aggregation of four flowers, which, in the only species I have examined, appears constant, as a complete quaternary division of one only. It remains to be ascertained whether the singular reversion of the situation of the ventral suture is more uncommon in aggregate than in solitary carpella.

Of the genus *Stauntonia*, *Assam* has two species, but only one is contained in my collection. The anomalous structure of the fruit has no doubt been explained by Dr. Wallich in his Tentamen Floræ Nipalensis, in which it is published under the name Holböllia, but which I am at present unable to consult. I find that the placentation of this genus is similar to that of Flacourtianeæ, with which

order I am not acquainted, and to that of Butomeæ; and hence the anomalous situation of the seeds. At the period of expansion of the flower, the ovula are much less developed than is almost universally the case: they present indeed the appearance of ovula at the earliest stages of development. I refer to this order a plant with long racemes of ternarily aggregate fruits, notwithstanding that it has milky juice, and that the Cotyledons are large, foliaceous and obliquely situated with regard to each other.

Among the *Cyrthandraceæ* a species occurs, (Chiliandra obovata, mihi,) remarkable for the structure of its mature anthers. These dehisce in a labiate and incompletely bivalvular manner, the lower and smaller valve being alone half reflexed. This valve is compound, and due to the mutual adhesion of the originally distinct inner locellus of each loculus. To this formation I have adverted in a short memoir on Rhizophoreæ, published in the Transactions of the Medical and Physical Society of Calcutta, although I was at the time ignorant of the existence of an example. *Assam* contains another interesting species of this family: this, which is remarkable for its pentangular petaloid calyx, and the "dehiscentia circumcisa," of its fruit, in which it approaches to Aikinia of Mr. Brown, I propose calling Cyananthus.

Scrophularianeæ afford one new genus, (Synphyllium torenioides, mihi,) an account of which will appear in the Journal of the Madras Literary Society, edited by my friend Mr. Cole.

Asclepiadeæ contain some interesting species, of which one constitutes probably a new genus, unless, indeed, it is referrible to Dr. Wight's Heterostemma, from which it would appear to differ in the valvular æstivation of the corolla. This species is remarkable for the aliform processes running along the larger veins of the under surface of the leaves.

To this order, or to Apocyneæ, is to be referred a remarkable plant, distinguished by the numerous longitudinal foliaceous alæ of its follicles, and, I speak from memory, its serrated leaves. This plant, which I have seen near *Mergui* on the *Tenasserim* coast, seems to have been sent by Captain Jenkins to Dr. Wallich with many others, none of which appear, however, to have excited much attention.

Among the *Borragineæ* we find one Myosotis and a species which, with the habit of some Anchusæ, appears to be not referrible to any genus of the order. The "umbilicus" occupies the centre of each carpellum, and is surrounded by an osseous elevated margin. The origin of this is totally distinct from that of Myosotis, and is wholly independent of fecundation. The radicle is in addition inferior.

The Monocotyledonous forms are chiefly those of other parts of India. Among the *Orchideæ* two species of Calanthe, and two of Pogonia occur, as well as one species of Spiranthes. Among the Gramineæ the most interesting is a Diandrous species of Alopecurus, which genus is, I believe, new to India; at least to any portion of the plains.

Of the Cyperaceæ, I shall only advert to the existence of four species of Carex, two of which are, however, from the Abor Hills; a third, which was originally sent by Captain JENKINS to Dr. WALLICH, appears to be widely distributed, extending from *Gawahatí* to *Jorháth*; the fourth; I have only met with about *Sadiyá*.

But perhaps the most interesting plants of the whole collection are contained among those "incertæ sedis," a division, always to a beginner, of great extent. Most of these are from the lower ranges of the Abor Hills; and the appearance of these is quite sufficient to ensure their being of great interest.

XI.—*Note on a Remnant of the Hun Nation.* [*Vide Chap. 26 of the "Decline and Fall of the Roman Empire" under the head of "Original Seat of the Huns."*] *By Captain* W. FOLEY.

"One of the princes of the nation *(Hun)* was urged by fear and ambition to retire towards the south with eight hordes, which composed between forty and fifty thousand families; he obtained under the title of 'TANJOU' a convenient territory on the verge of the Chinese Empire." (A. D. 48.)

Now, there are a people located in various parts of the *Bama* (Burmese) and *Shan* (Siamese) empires, who are distinguished by the appellation of "*Ton-soo*" or "*Ton-dzoo*:" they have a language of their own, and differ in feature, dress, and domestic manners from the inhabitants of the country in which they reside; they never intermarry with their neighbours, and assert their descent from "a *people who came from the north*;" they are an ugly, swarthy race; both men and women closely resembling the picture of the *Huns* drawn by GIBBON in his immortal history. Broad faces, flat noses, small eyes, short, squat (but athletic) figures, are the most prominent beauties. The men wear their hair long in common with the *Bama*, but their dress, which is always of a dark colour, much resembles the garb of the Chinese: the women have a fillet of dark-coloured cloth (generally with a red or white border) tastefully arranged as a head-dress, and falling down over the back; a mantle of the same colour and material extending from the shoulders to a little beyond

the knee, is the only remaining garment. Their legs, which are extremely thick, are covered with a number of metal bangles; these, with the exception of the ear-ring (*nad-dán*) are the only ornaments worn by the females of the *Ton-soo* race.

I am persuaded that these people are the descendants of the "Tanjou" described by Gibbon, a *remnant of the ancient Huns!!* preserved during a lapse of 1788 *years* uncontaminated with the blood of strangers!!

Turning over the pages of Gibbon very lately, I happened to notice the subject. I regret exceedingly that I was not aware of this singular coincidence during the time of my temporary residence in the neighbourhood of this people—how much might have been elicited!

XII.—*Table shewing the breadth of the river Satlaj and the rate of its current at different stages from Harríke Pattan to its junction with the Indus at Mithankot.*

[Communicated by Capt. C. M. Wade*.]

Names of the Stages.	Breadth of the river Satlaj.	Rate of the current.	Names of the Stages.	Breadth of the river Satlaj.	Rate of the current.
	In yards.	Kts. Ft.		In yards.	Kts. Ft.
At Harríke,	352	1 32	At Pala,	306	1 05
,, Bundáli,	220	1 24	,, Núrpúr,	360	2 03
,, Firozpúr,	308	1 32	,, Khyrpúr,	381	1 34
,, Mamdot,	528	1 30	,, Núr Mohamad kí goth,	176	1 04
,, Khúghgi,	154	1 20	,, Gúldera,	308	1 30
,, Karrían,	220	1 22	,, Bahawalpúr, or Bindríwalá,	616	1 06
,, Ladúke,	308	1 40	,, Náharwalá,	220	2 01
,, Jagvairá Salemká,	264	2 00	,, Buddúke,	308	2 00
,, Juwunda Búngá,	154	1 13	,, Mírpúr,	572	1 04
,, Chúnní,	418	1 35	,, Makkhanbelá,	605	2 00
,, Bachawalí,	264	1 13	,, Sítpúr,	577	1 40
,, Jhúlná,	484	1 41½	,, Shydaná,	572	2 01
,, Akokí,	572	2 00	,, Mithankot,	858	1 13
,, Khajh Bazídpúr,	198	1 41			
,, Núnkeh,	266	2 00			

* We were in hopes ere this to have been favored with a copy of Captain Wade's journal and survey of the river *Satlaj*, for publication. Specimens of the soil and rocks on the banks have been long in our possession, awaiting further illustration, which want of leisure has doubtless prevented.—Ed.

TABLE, No. 2.

Shewing the distance of the Stages in Miles, and the Soundings of the River from stage to stage.*

Names of Stages.		Sounding.	Av.
From Harríke to			
,, Bundálí to	13	14 feet.	
,, Firozpúr to	10	10,8,12,16,12,11,12,10,11,9,12,14,12.	10½
,, Mamdot to.....	14	11,12,14,14,14,12,12,6,5,6,6,7,8,12,11,14,6.	10
,, Khúghgí to	13	8,8,12,6,6,6,6,5,13,8,5,5,5,12,14,10,	8
,, Karríán to.....	9	10,18,16,22,11,10,11,9,12,2.	13
,, Ladúke to.....	13	12,12,12,9,9,7,14,12,9,11,15,6,15,11,15,8,7,15,17,14.	11½
,, Jagvaiá to.....	23	7,6,5,13,5,12,10,12,18,22,14,9,20,9,12,14,12,22,11, 10,14,14,6,6,14,10,11,5,3,5,10.	11
,, Juwunda Búngá,	8½	14,14,14,6,6,14,10,5,5,5.	9
,, Chúnní to	11	8,10,14,10,12,9,12,9,10,8,7,7,13,6,12,12.	10
,, Bachawalí to.. ...	13	8,11,13,12,8,7,6,6,3,5,8,12,12,14,14,8,8,8,6.	9
,, Jhúiná to	16	8,8,9,9,6,14,15,14,8,7,12,16,11,16,15,15,16,12,12,14, 9,11,6,7,6,6.	10¾
,, Akokí to	13	6,14,14,15,12,9,11,11,11,11½,8,9,10,7,18,14,18,13.	11¾
,, Khajh Bazídpúr,	15	12,12,9,8,6,7,6,5,9,11,13,12,8,7,6,6,6,5.	8½
,, Núnkeh to	12	5,4,6,7,11,12,14,3,3,3,3,4,7,11,11,24,4,4.	8
,, Pala to	13	14,14,11,7,16,12,8,11,8,8,9,9,6,7,12,13,18,11.	10¾
,, Núrpúr to	24	11,16,9,7,6,7,13,14,15,6,7,9,20,8,6,8,7,8,12,14,15,6, 7,9,15,9,10,10,11,7,14,16,16,16.	11¼
,, Khyrpúr to	20	7,10,6,11,12,18,14,12,18,9,16,12,11,12,11,6,8,12,11, 7,5,12,10,11,11,9,14,11,13.	10¾
,, Núrmohamad, ..	10½	9,11,14,15,14,15,11,11,12,16,7,6,15,8,7.	11½
,, Gúldera to	12	7,5,11,6,7,11,16,9,12,18,19,11,11,9,7,20,8.	11½
,, Bahawalpúr to ...	11½	11,9,8,16,18,13,9,13,14,18,18,8,9,12.	11½
,, Náharwalá to ...	11	12,13,7,12,11,9,6,9,8,7,6,9,12,18,9.	10
,, Budduke to	5½	9,12,16,16,13,7,6,14.	11½
,, Mírpúr to	14	7,6,14,17,16,13,7,11,20,16,12,13,14,12,12,18,12,11, 14,12.	16
,, Makkhanbelá, ..	13	9,7,15,9,7,9,12,19,15,9,18,14,18,24,21,19.	14
,, Sítpúr to	10	14,11,17,18,14,12,14,18,7,9,12.	13
,, Shydaná to	14	24,24,15,13,14,9,14,17,24,12,12,12,12,12,12,13.	15
,, Mithankot,.....	15	11,9,8,14,12,12,13,24,17,12,13,14,17,18,15,24,27.	14

TABLE, No. 3.

Shewing the distances both by water and land from Ropar to the principal towns on the Satlaj as far as Mithankot.

Names of places with their distance from Ropar.	Akbarí Kos.		Statute Miles.	
	By water.	By land.	By water.	By land.
From Ropar to Lodiáná or Filor Ghát, .	37	32	46½	40
,, Ditto to Harríke,...	86½	77	108½	96
,, Ditto to Firozpúr, ...	104	95	132½	119
,, Ditto to Mamdot, ...	118½	105½	148½	132
,, Ditto to Gaurjiáná, ...	174	149	216½	186
,, Ditto to Fatehpúr, ...	274	224	342½	282
,, Ditto to Bahawalpúr,.....	307	248	385	313
,, Ditto to Cuch, ...	346	277	433	337
,, Ditto to Mithankot, ...	381	310½	476½	388

* These soundings were taken between the 1st of Jan. and 7th of March, when the river is at its lowest depth throughout.

XIII.—*A Comparative view of the daily range of the Barometer in different parts of India. By* James Prinsep, *Sec. As. Soc. &c.*

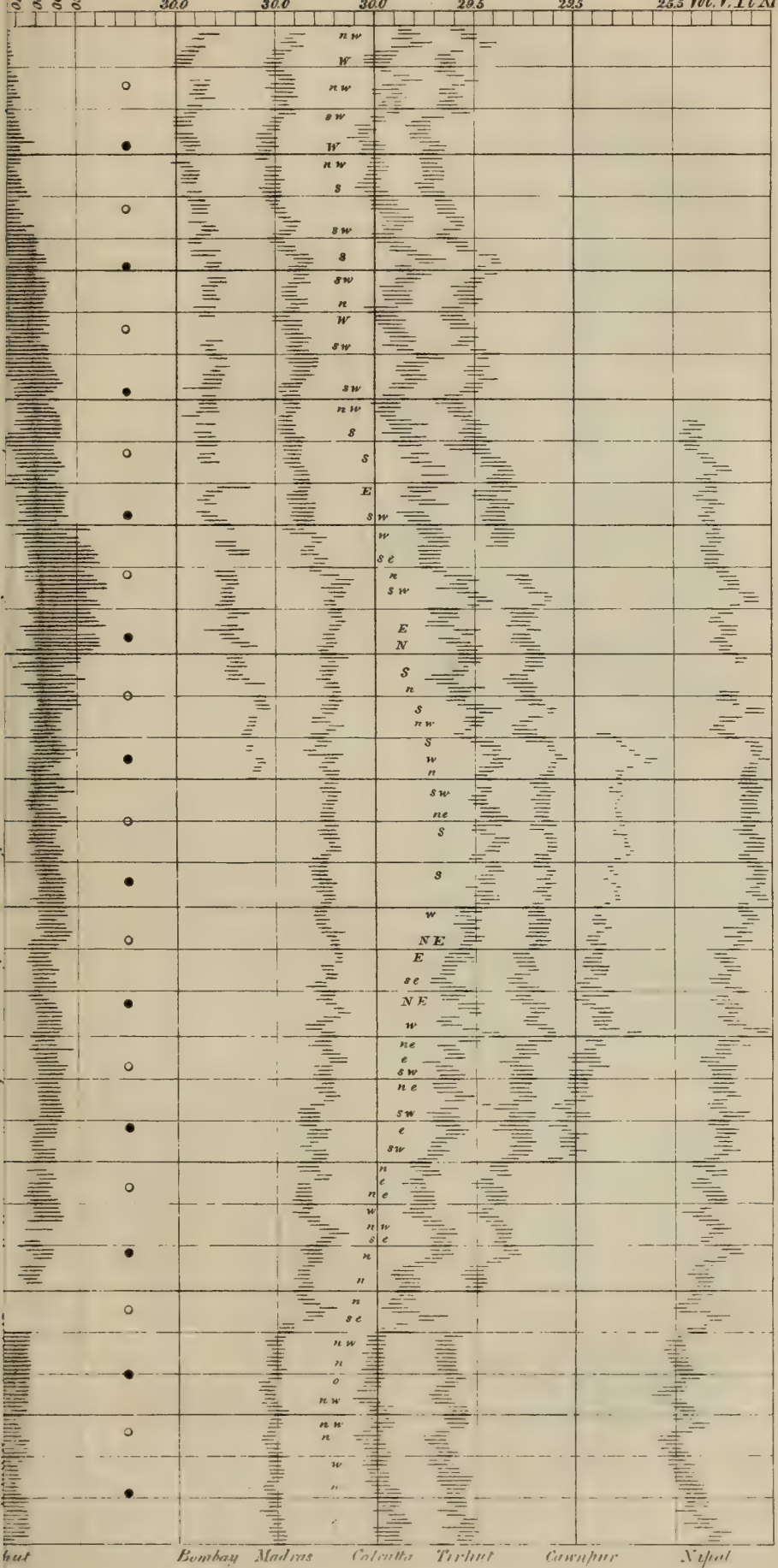
The friends who have for the last two years favored me with copies of their Meteorological Registers, have doubtless accused me of a most ungracious requital of their labours, in the long slumber to which they have apparently been devoted in my editorial escrutoire! Such is not absolutely the true state of the case; but the number attached to the accompanying plate* will, I fear, testify against me to the extent of having kept back for nearly a year, the curious facts that had been elicited from the possession of so many valuable records of the weather.

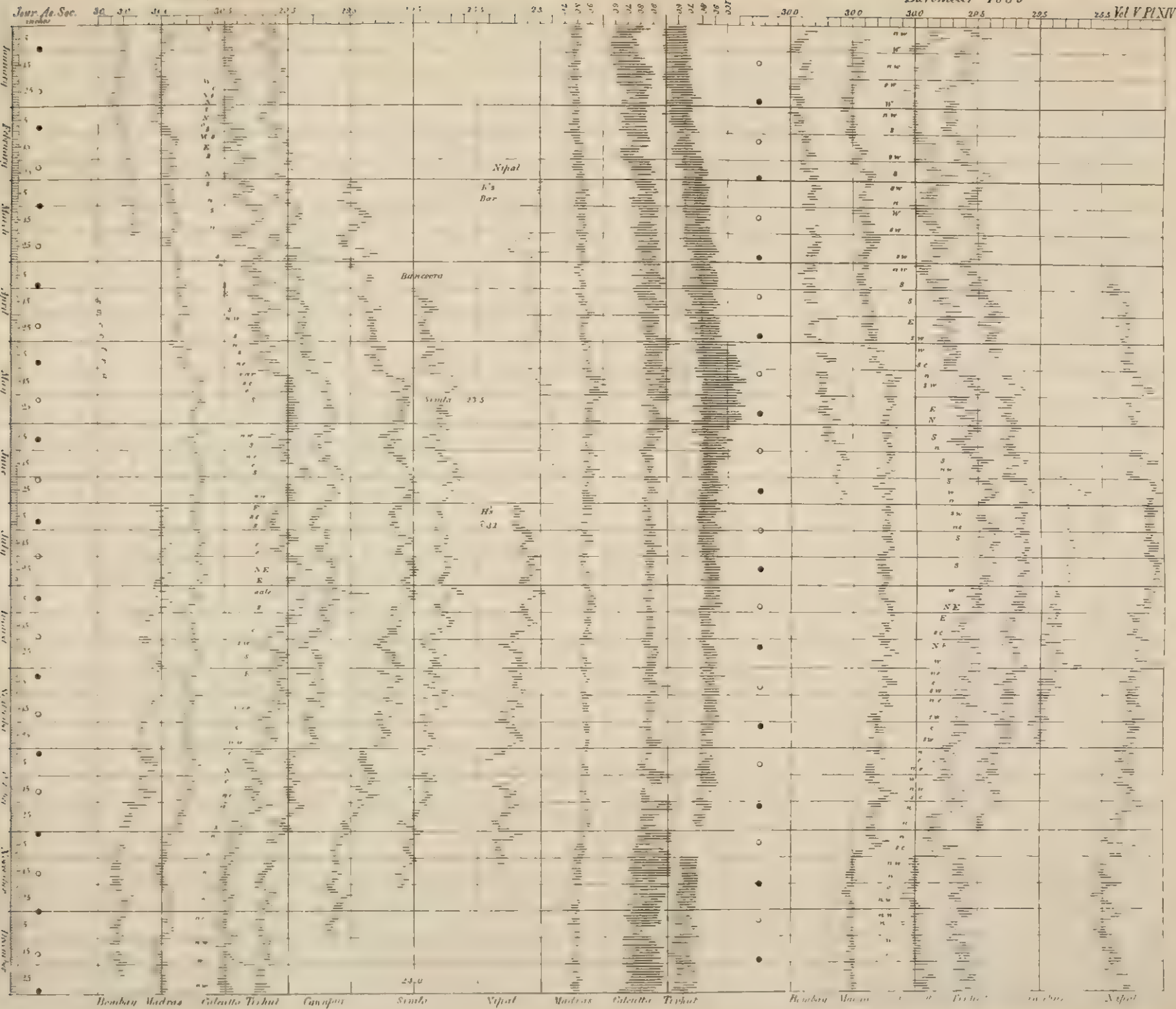
The fact is, that the prompt attention with which my appeal was answered by observers of the weather in numerous parts of India, served as a check to the immediate publication of the materials supplied. The very voluminous dimensions of such registers, and their dry and unperusable nature, even by the few who would like well to consult them, set me about contriving some method of condensing their results into convenient compass, and exhibiting them to the eye in a manner more perspicuous than could possibly be accomplished by a mass of mere figures.

The usual form of a diagram of zigzag lines from point to point would apply tolerably well to a series of single daily observations, taken at a particular hour, and would trace out in a gently undulating curve, the course of annual variation; but if made to embrace the double daily oscillation, now well known to be steadily pursued by the Barometer in intertropical climates, it was evident that the alternations would be too confused on a small scale to be followed pleasantly by the eye. A slight modification suggested itself, as calculated to remove all objections to this mode of displaying the phenomena, without taking in any degree from the accurate notation of the fixed points of observation, while it represented more palpably the amount of daily oscillation. The modification to which I allude will be readily understood by inspection of Plate XIV. It consists in breaking the connection between the consecutive days, and merely laying off, in short parallel lines, the interval between the maximum and minimum readings of the instrument. The proximity of the lines enables the eye to fancy an imaginary line drawn centrally through them to represent the mean course, without the necessity of drawing it, while errors of the tenth of an inch, so liable to occur, and so difficult of detection in a series of figures, became at once obvious and remediable. The chief

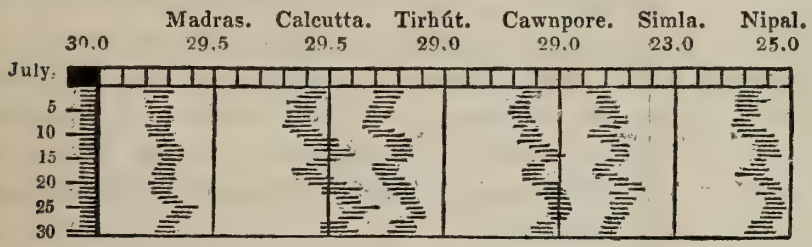
* It was first printed as Plate IX. subsequently altered to XIV.

Barometer 1835




Barometer 1834
Thermometer 1834
Barometer 1835
Jour. As. Soc.
Vol V Pl XIV
Nipal
Barometer
Simla 235
Bombay Madras Calcutta Tirhut Cawnpur Simla Nipal Madras Calcutta Tirhut
Bombay Madras

advantage, however, of the plan of parallel lines was, that type might be adapted to express the observations with as much facility as to a figured statement. Having the brass rules of my calendric scales already divided according to the days of the year, it only would be requisite to cast a quantity of rules of the thickness of one day, and exactly one-tenth of an inch in breadth; the printing surface of some being retained of the full length, and that of others reduced successively one hundredth, two hundredths, three hundredths, &c., so that nine varieties, and a large supply of blanks or quadrates of the same dimensions, would be sufficient to lay off any series correct to the hundredth of an inch, which is ample for most purposes. I here give a sample of this mode of registry in type, although, as I had previously engraved a copper-plate divided for the purpose, I have not, on the present occasion, made any use of the typographic plan, in spite of the far greater expedition and precision of which it is capable.



It is merely necessary to denote by figures at the top, the value of the neutral line from which each set of readings is to be estimated right and left, in some even division of the inch, as 29.50 inch for *Calcutta*; 29.00 inch for *Tirhut*, or 25.00 for *Nipal*, &c. To reduce the lines into figures when requisite, an ivory inch scale may be applied, but this will seldom be necessary if such linear tables are accompanied by monthly abstracts in the ordinary form: the chief advantage of the lines being to shew at a glance the variations of pressure or other phenomena, during the month, in a very small compass, and for many localities at the same time.

Having thus explained the principles upon which the accompanying plate was filled up,—a work of no small patience by the way, seeing that it contains 13 columns of 365 double entries, or nearly 10,000 individual measurements laid off by scale to the hundredth of an inch,—I will proceed to notice, first, the authorities whence the various columns are derived; and, secondly, the instructive and highly curious facts it discloses.

The *Madras* column is extracted from the registers published by Mr. Taylor, the H. C.'s Astronomer at *Madras*, in the Journal of the Literary Society at that place. For the *Bombay* column I am indebted

to my brother Assay Master, Mr. Noton, who kindly sent me copies of some registers made mostly during his absence. The series is broken in many places, and the observations between June and October, 1834, were evidently taken by an inexperienced hand. The single line marked *Socotra* is from the register kept by Captain Haines while engaged in the survey of the island. As the hours chosen by him were not those of the maximum and minimum, I thought it best to confine myself to the noon readings as a mean of the day. The *Calcutta* columns are taken from my own registers, published in this Journal. The *Tirhút* diary was kept at my request by my cousin, the late Mr. Thomas Dashwood, Judge at *Mozafferpur*, who kept it up unremittedly for three years and a half, indeed until a very few days before his sudden and lamented death*. One year of this series has already been published at length in the 2nd and 3rd volumes of the Journal. For the *Cawnpore* register I am beholden to Colonel G. Pollock, C. B. of the artillery. This series is unfortunately intermittent, from his having been obliged to send his barometer to *Calcutta*, in December, 1834 : which, however, furnished an opportunity of comparing it with my own standard. A little to the right of the *Cawnpore* line for 1834, are entered the observations of Mr. Ritchie at *Bancoora*, for April and May, also abruptly terminated by his falling an untimely victim to the climate.

The last series to the right I owe to Captain Robinson of the *Nipal* Residency; it was made partly with his own and partly with Mr. Hodgson's instrument, which will account for the shifting of the index point in June, 1834. In March also two adjustments were attempted by boiling the tube. These do not affect the utility of the register, when once noted. Captain Robinson's tables are invaluable from the number of periods during the day they embrace, but these will be alluded to hereafter in summing up the figured abstracts.

I was disappointed of getting any observations from the western hills, (the seat of the grand trigonometrical operations still going forward in those parts,) until after the plate had been long finished and the whole edition struck off, when Mr. H. S. Boulderson of *Moradabad* kindly transmitted me a file of observations taken by his brother, Mr. S. M. Boulderson, at *Simla*, between May and November, 1834. Rather than lose the valuable additional evidence which this register, at a position elevated about 7000 feet, and situated 400 miles to the west of *Katmandhu*, would afford, I have caused it to be

* An apoplectic fit terminated his life of exemplary public service and private worth, at the very moment of his quitting employment, and retiring home to devote his latter days to the education of his family in England.

inserted, under the *Bancoora* column, heading the index line 23.50, to correspond with the average range of the barometer at *Simla** and have reprinted the plate.

The first feature in the table that attracts attention is an almost perfect parallelism in the march of the barometer at *Calcutta, Bancoora, Mozafferpur, Cawnpore, Nipal* and *Simla*—places situated many hundred miles asunder from $22\frac{1}{2}^0$ to 28° north latitude, and 80° to 88° east longitude, with altogether differently prevailing winds and climates, and opposite geographical features. The same parallelism continues even as far south as *Madras*, but the *excursions* are there much subdued in every respect, and occasional deviations are observable, which seldom or never occur in the three Gangetic lines, except from such a local hurricane as that experienced in the immediate neighbourhood of *Calcutta* on the 3rd August, 1834. Between *Bombay* and *Calcutta*, little conformity of detail can be perceived, though the general direction is symmetrical. There is, however, considerable accordance between *Bombay* and *Madras*, the former having from its higher latitude a wider range of oscillation, both annual and intermediate.

The direction of the wind (at least of the lower stratum) alone seems quite insufficient to account for the barometrical variations, although it is generally true that the mercury rises with the prevalence of northerly, and falls with that of southerly winds, as might be expected from the different specific gravity of a warmer or colder atmospheric column. That the moon also has no regular influence appreciable on the scale of my table, must be, I think, also granted; for as many instances occur of a falling as of a rising barometer at the changes of lunar phases. The course of the thermometer, on the contrary, seems to have a decided connection with that of the barometer. This is exemplified in the comparative uniformity of the *Madras* line, and the increased curvature at other places. For convenience of division I assumed the tenth of an inch, as representing 10 Fahrenheit degrees of temperature. Had I taken double that amount, the general thermome-

* Having the former copy of the plate at hand, I have distributed it detached along with the other, hoping it may attract notice and procure me a fuller collection for some future year.

I have been also favored with a daily barometrical series for 1836 at *Bangalore*, by Dr. Mouat, but I have reason to think that the instrument used was sluggish in its movements. I trust, however, for the ensuing year, the labours of this zealous observer will be made available by the possession of better instruments. I have further many other broken series from *Assam, Kyouk Phyoo, Candy*, &c. but they are generally wanting in the barometer. A short series was also kept for me by Lieutenant Montrion, I. N. at the head of the bay in January and February, 1833.

tric curve for the year would have been nearly symmetrical with that of the barometer, except during the rainy season.

It should be remarked, that the daily undulations of temperature for *Calcutta* and *Tirhút*, are the extremes indicated by a register thermometer exposed to night radiation and noonday sun: those for *Madras* are only the variations of morning and afternoon heat in the shaded air. They both, however, but the former more distinctly, shew to the eye the influence of clouds and rain in diminishing the diurnal excursion; and in this respect a direct accordance is also observable in the reduced diurnal motion of the barometer; as I long since pointed out to be the case in regard to the *Benares* tables published in the Asiatic Researches, vol. XV.

Another material point to be noticed in the plate is the gale of the 3rd of August, when the *Calcutta* barometer dropt down to 28.8 inches passing (on the plate) through the *Tirhút* column, which is only partially affected. There is in all the lines a decided fall at the same period, but only of an ordinary extent, apparently unconnected with the disturbing cause of the *Calcutta* storm. Any who have witnessed the gathering of a north-wester during the calm serenity of a sultry evening, and have watched the turbulence of the clouds and commixture of upper currents prior to the sudden and furious generation of the whirlwind below, will be prepared to consider the hurricanes and gales of longer duration as equally insulated in their origin, only upon a much larger scale of operation. A sudden condensation of aqueous, or perhaps of gaseous matter, whether by electricity or simple cold, would, by drawing upwards toward the vacuous space, the under air, cause a fall in the barometer as certainly as if there were an absolute removal of superincumbent weight, for which there would be no mode of accounting; and this upward current could not take effect without the production of a horizontal current of corresponding degree and velocity.

The last point of instruction to be gained from the present plate,—and it is a very important one,—is the reliance that may be placed on the measurement of barometrical altitudes taken by comparing the observed height at places so distant as *Cawnpore*, or in the mountainous regions of the *Himálayas* with the register of a stationary instrument at *Calcutta*. I confess I always had misgivings on the comparability *inter se* of such distant readings, until as it were my hand refuted the doubts of my mind. The engraving shews that a dozen contemporaneous observations (that is, observations not made at the same instant, but at the same relative hour), would be ample for fixing the altitude of a place within moderate limits. Moreover, it shews that no reference of an observed height to a fixed unit (as 30 inches), as-

sumed as the barometric zero at the level of the sea, can possibly be trusted: hence the advantage of maintaining a constant register at one or several fixed spots; nay, it may be almost regarded as a public desideratum, where, as in India, the Government has so much to learn of the physical geography of its vast territories.

Want of space has prevented my including in the plate the thermometric columns for 1835; but the temperature does not require such minute discussion as the pressure, for obvious reasons. The hygrometrical phenomena also are rather unsuitable to graphic illustration. The monthly averages to which we must now pass will, it is hoped, be sufficiently comprehensive in these departments to cause no regret at the unavoidable suppression of the daily registers.

Beginning, then, with the Bombay and Socotra series we have the following

Abstract of Bombay Observations for part of 1834, *by Mr.* Henderson: *for* 1835, *by Mr.* S. Frazer.

	Barometer uncorrected.			Thermometer.		
	10 A. M.	Noon.	3 P. M.	10 A. M.	Noon.	3 P. M.
1834.						
January, .	30.06	30.03	29.98	76.5	77.5	79.2
February, .	30.03	30.00	29.95	77.2	78.7	80.0
March, ..	30.01	29.97	29.93	79.5	85.5	82.0
	Barometer reduced to 32°.					
1835.						
January, .	29.974	29.939	29.889	.. Sunday Obs. carent.		
February, .	.898	.907	.853	.. ditto.		
March, ..	.875	.837	.788	from 12th to 16th carent.		
April, ...	.890	.851	.790	16 to 20 ditto.		
May, ...	.779	.752	.736	2, 3, 8 to 10 ditto.		
June, ...	.662	.639	.612			
July, ...	.610	.605	.579			
August, ..	.688	.663	.630			
September	.730	.727	.626			
October, ..	.823	.786	.729	} 30th Oct. to 3rd Nov. carent		
November,	.935	.941	.900			
December,	.980	.957	.902	from the 25th carent.		
Means, ..	29.824	29.800	29.753			

Mr. Noton, fancying I was only in want of the barometrical series, has omitted to send that of the thermometer or of the weather in general. His own observations for many years on the climate of Bombay are, however, published, and will supply the deficiency when we come to take a general review.

Abstract of Observations taken on the coast of Socotra, on board the H. C. S. Palinurus, H. B. Haines, *Commander, in* 1834.

Month.	Barometer at 32°.			Thermometer.			Wind.	Weather.
	8 A.M.	Noon.	8 P.M.	8 A.M.	Noon.	8 P.M.		
January, .	29.429	29.416	29.414	76.7	80.7	79.4	ENE.	cloudy, 7 days rain.
February, .	.405	.396	.395	77.2	80.5	78.5	ENE.	hazy and squalls.
March, ..	.393	.377	.370	75.5	81.0	80.9	NE.	calms—clear.
June, ...	.093	.087	.077	86.9	91.5	90.0	SW.	hard gales.
July, ...	.089	.082	.082	84.0	87.0	86.2	SW.	hard gales.

The last two months' journal contains also the readings at 4 A. M. sunrise, 3 P. M. and sunset; but necessarily on board a ship in heavy weather, the diurnal oscillations cannot fairly be estimated.

We may now pursue the same course with Mr. Dashwood's tables for *Tirhút*, from December, 1833, (prior to which they have already been inserted,) first only reducing the barometric altitudes to 32°. Mr. Dashwood, following my recommendation of tapping the tube before reading off, has, as I expected, made the daily oscillation considerably greater than in his first register. Thus also my new standard barometer is found to oscillate full a fifth more than the old, so that the real external change of pressure during the day is hitherto only approximately known, and may perhaps be nearer $1\frac{1}{2}$ than 1-tenth of an inch.

Monthly Abstract of Meteorological Observations, kept daily at Mozafferpúr in Tirhút, from the 1*st December*, 1833, *to the* 31*st May*, 1836, *by the late* Thomas Dashwood, *Esq. C. S.*

Month.	Barometer reduced to 32°.		Thermometer in doors.		outside.		Winds Number of days.				Days Rain.	Weather.
	9¾ A M inch.	4½ P M inch.	9¾ A M	4½ P M	Max.	Min.	W.	E.	N.	S.		
1833.			o	o	o	o						
December,..	29.662	29.570	62.0	64.1	70.1	54.8	18	13	0	0	8	fogs and showery.
1834.												
January, ..	29.670	29.572	58.0	61.0	68.5	48.5	20	10	1	0	0	clear, cold.
February, ..	29.620	29.531	64.6	69.2	75.5	56.4	14	12	1	1	1	fair, changing.
March, ...	29.550	29.439	72.6	76.4	85.4	63.7	16	14	1	0	2	W.in day,E.at night.
April, ...	29.470	29.367	77.4	78.6	91.2	69.4	11	18	1	0	0	do. 4 northwesters.
May, ...	29.281	29.195	84.2	85.5	108.6	75.3	0	31	0	0	3	wind strong at night.
June, ...	29.204	29.133	83.7	85.4	95.4	76.8	1	29	0	0	14	Cloudy and squally.
July, ...	29.252	29.167	84.0	85.6	92.3	77.7	0	30	0	0	15	earthquake on 11th.
August, ...	29.280	29.194	83.8	85.4	90.3	77.9	7	21	2	1	12	changeable.
September,	29.373	29.264	83.5	81.7	89.8	78.0	3	20	0	0	10	fair, earthquake.
October,....	29.525	29.450	79.5	81.0	85.2	74.0	9	9	0	0	10	gale on 4th,wet,fine.
November,..	29.722	29.621	71.5	74.0	73.8	57.7	23	5	2	0	0	fine, clear.
December,..	29.762	29.660	65.1	67.8	70.7	53 6	21	10	0	0	3	hazy, fogs in morn.
1835.												
January,....	29.775	29.687	59.5	63.1	65.5	44.5	22	9	0	0	1	do. clear days.
February, ..	29.761	29.672	65.0	69.6	72.8	52.8	12	15	0	1	4	4 squalls, fine.
March, ...	29.675	29.601	71.5	76.5	83.0	57.7	25	4	0	0	2	cloudy, fair.
April, ...	29.659	29.528	78.4	80.2	93.9	66.6	14	16	0	0	4	frequent squalls.
May, ...	29.472	29.365	82.4	83.7	95.3	74.1	5	26	0	0	4	several storms.
June, ...	29.377	29.306	83.0	84.6	93.9	74.1	0	29	0	1	10	very heavy hail 14th.
July, ...	29.331	29.268	81.9	82.5	88.8	73.9	10	17	1	0	21	constant rain.
August, ...	29.399	29.310	82.8	84.1	88.2	73.1	12	17	1	0	14	3 storms, fair.
September, .	29.494	29.380	81.5	83.6	86.8	71.3	3	25	1	0	6	6 northwesters,fair.
October,....	29.605	29.518	78.1	80.4	82.0	64.8	18	11	2	0	1	light winds, fair.
November,..	29.829	29.741	67.8	71.7	72.4	53.6	16	5	1	0	0	clear, 1 fog.
December,..	29,772	29.671	61.0	64.6	68.4	47.0	13	18	0	0	2	heavy fogs, 1 squall.
1836.												
January,. ..	29.775	29.678	56.8	60.6	65.1	41.4	21	10	0	0	1	natural ice 3 nights.
February, ..	29.697	29.598	61.8	65.5	72.2	48.3	12	17	0	0	6	changeable, fair.
March, ...	29.499	29.393	73.6	77.2	86.5	60.2	7	14	2	0	2	fair, 2 storms.
April, ...	29.409	29.291	78.9	80.4	94.4	66.8	11	15	0	0	1	W. morn, E. night.
May, ...	29.275	29.185	83.3	85.1	97.8	73.5	3	22	0	0	6	clear, squally.
Means, 1833.	29.433	29.348	76.0	79.0	87,0	69.1	132	232	?	?		
Means, 1834.	29.475	29.383	75.6	77.6	85.5	67.4	125	209	8	1	70	The depth of rain
Means, 1835.	29.595	29.503	76.1	77.1	82.6	62.8	150	192	6	2	69	was not noted.
Mean of 3 ys.	29.501	29.411	75.9	77.9	85,4	66.4						
General mean,	29.456		76.9		75.9		$\frac{2}{6}$ W. $\frac{3}{5}$ E.					

The *Tirhút* Barometer had not been compared with my standard.

The *Cawnpore* table needs no particular remark. The daily notices of the weather are very full, but unfortunately there is no possibility of abbreviating them. I have attempted in some measure to meet this difficulty, as in the *Tirhút* tables, by numbering the days of each prevailing wind, and of rain. The predominance of easterly winds strikes me as rather anomalous during the hot season; but I have witnessed the same irregularity at *Benares*. The hot westerly wind is purely a day breeze, and very rarely extends to the night, which is generally calm, or has a light air in the opposite direction.

Abstract of a daily Register of the Weather at Cawnpore, kept by Col. G. Pollock, *C. B. during the years* 1834 *and* 1835.

Month.	10 A. M.			4 P. M.			Wind, days.				Rain days.	
	Barometer. at 32°.	Thermometer.		Barometer. at 32°.	Thermometer.							
		House.	Air.		House.	Air.	N.	E.	S.	W.		
1834.	inches											
Jan.....												
Feb. ..	29.693	—	—	—	—	—	—	6	—	8	3	only 15 days observed.
March,	29.50[illegible]	77.1	—	—	—	—	4	12	—	14	1	clear, one storm.
April, ..	29.403	80.0	—	—	—	—	5	9	—	10	3	terrific dust, storm 15th
May, ..	29.217	86.1	—	29.114	86.5	—	—	14	1	15	—	wind chgd.to W.at noon
June, ..	29.129	86.5	90.4	29.045	86.7	94.1	2	18	—	11	7	do. frequent squalls.
July, ..	29.126	84.8	85.2	29.053	85.8	87.0	1	25	—	5	5	a few light showers.
Aug. ..	29.180	84.3	84.6	29.108	86.0	87.1	4	14	1	12	13	wind variable, cloudy.
Sept....	29.271	82.5	82.1	29.189	83.3	83.9	3	20	1	6	17	much rain, cloudy.
Oct.....	29.469	77.5	77.2	29.375	80.5	80.7	10	14	—	7	4	wind strong, 1 storm.
Nov....	29.640	71.2	72.8	29.570	76.3	77.7	3	1	1	8	—	13 days obs. clear.
Dec. ..	—	64.6	64.0	—	69.3	71.0	20	5	1	5	4	clear ; rain at Xtmas.
1835.												
Jan.....	—	59.5	58.1	—	67.7	69.5	6	4	—	2	—	strong winds, cloudless.
Feb.. ..	—	64.0	64.3	—	71.0	74.7	8	6	2	12	2	light clouds, 1 squall.
March,	—	70.7	72.9	—	73.8	81.4	3	8	3	17	3	strong winds & squalls.
April, ..	—	77.8	85.0	—	78.3	92.1	6	10	6	8	9	dust storms, cloudless.
May, ..	—	82.0	93.0	—	81.8	100.0	1	18	3	9	5	unusually hot.
June, ..	29.243	82.8	87.4	29.237	83.5	93.0	2	19	2	7	13	rains begun 16th.
July, ..	29.285	81.8	86.2	29.267	83.3	88.2	1	6	7	17	11	heavy clouds, rain light.
Aug. ..	29.432	82.4	87.6	29.360	83.4	90.3	3	13	4	11	14	much rain, cloudy.
Sept....	29.543	81.0	95.5	29.445	81.7	88.6	9	15	1	5	8	cleared on the 25th.
Oct.....	—	—	—	—	—	—	—	—	—	—	—	
Nov.	29.656			29.573								Col. Pollock's Barom.
	.922	69.7		.850	74.8							Dr. Dempster's do.
	.870			.751								Mr. Campbell's do.
Dec. (9 dys.)	.676			.87								Col. Pollock's do.
	.955	64.6		.70	70.0							Dr. Dempster's do.
	.898			.782								Mr. Campbell's do.

The error of Colonel Pollock's instrument when compared with my standard in April, 1835, was only — .059. It is difficult therefore to account for its standing so much lower than Dr. Dempster's, and Mr. Campbell's, unless some accident happened to it on its return to Cawnpore.

The *Bancoora* series, being limited to two months, will not admit of an abstract; we may therefore pass to the *Nipal* tables.

Abstract of Daily Barometrical Observations, made at Katmandhu in Nèpál, by Capt. G. H. Robinson.

Months.	Mean height of Barometer reduced to 32° for the hours													Maxima.	Minima.	Daily Range.
	A.M. 7	8	10	11	12	P.M. 1	2	3	4	5	6	7	8			
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.			in.
1833.																
July, ...	..	..	..	..	..	..	..	..	..	..	..	..	..	25.126	.062	.063
Aug.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.148	.083	.060
Sept.	..	..	..	..	..	..	..	..	..	..	..	..	..	.225	.153	.064
1834.																
July, ...	25.168	.176	..	.162	.144	.121	.101	..	.070	.073	.119	..	.129	..	..	.088
Aug.....	.171	.185	..	.168	.159	.127	.109	..	.096	.101	.053	..	.154	..	..	.074
Sept.	.257	.270	..	.259	..	.206	.168	..	.161	.174	.233	..	189	..	..	.109
Oct.....	.325	.344	..	.333	.310	.279	..	.235	.233	.240	..	.264	..	..	..	.111
Nov.	.413	.440	..	.435	.423	.326	..	.328	.354	..	..	.381	..	..	..	.086
1835.																
April,.. ..	.401	..	..	..	.395	..	.355	..	.317	..	..	.341	.	.399	.323	.074
May, ...	.305	..	..	..	.292	.	.250	..	.221	..	..	*.240	..	.301	.220	.071
June,.....	.198	..	..	..	.170	..	*.125	..	*.114	..	..	*.147	..	.285	.112	.073
July, ...	*.142	..	.149	..	,125	..	*.184	..	*.073	..	..	*.102	..	.149	.072	.074
Aug.....	*.233	..	.240	..	.219	..	*.169	..	*.153	..	..	*.178	..	.287	.106	.078
Sept.	*.315	..	.320	..	.289	..	*.238	..	.218	..	..	*.238	..	.319	.217	.093
Oct.....	*.084	..	.407	..	.367	..	.313	..	.295	..	..	.305	..	.392	.291	.092
Nov.	*.513	..	.541	..	.499	..	.450	..	.425	..	..	.44	..	.539	.428	.098
Dec	*.457	..	.493	..	.449	..	.390	..	.383	..	..	.417	..	.493	.376	.113

Abstract of Thermometrical Observations, made simultaneously with the above.

Months.	Thermometer inside the house.										Thermometer outside.					Rain.	
	A.M. 7	8	10	11	12	P.M. 1	2	4	5	6	8	A. 7	M. 10	12	P. 2	M. 4	
1833.																	
July, .	75.2	..	..	..	..	..	79.2	..	..	..	..	69.3	..	..	84.6	..	9,517
Aug...	73.9	..	..	..	..	..	76.7	..	..	..	.	69.6	..	..	81.8	..	13,720
Sept. .	73.4	..	..	..	..	..	77.1	..	..	..	..	67.9	..	..	78.5	..	3,822
1834.																	
July, .	74.6	75.4	..	76.8	77.4	77.9	78.3	77.9	77.7	77.2	77.0	..	..	..	..	..	14,436
Aug...	73.7	74.5	..	76.3	74.0	77.8	78.0	77 4	76.7	76.9	76.3	..	..	..	..	..	12,380
Sept. .	73.3	73.9	..	76.3	..	77.9	78.3	78.1	77.3	75.3	77.6	..	..	..	..	..	11,292
Oct...	66.2	66.2	..	69.2	69.8	70.2	70.7	71.4	71·3	70.2	..	..	..	..	..	..	9,930
Nov. .	60.0	61.7	..	63.1	63.0	66.1	..	65.0	..	65,2	..	..	..	..	..	..	1,280
1835.																	
April,.	64.1	..	..	..	67.7	..	67.7	68.5	..	..	..	54.7	..	72.8	74.3	71.8	4,352
May, .	69.3	..	..	..	71.3	..	73.2	74.2	..	..	..	62.9	..	77.1	78.0	77.1	4,207
June,.	73.3	..	..	..	75.3	..	*76.2	*76.4	..	..	..	69.3	..	80.3	79 9	*76.9	7,941
July, .	*73.8	..	75.2	..	75.7	..	76.7	*76.4	..	..	..	*73.4	77.6	81·0	79.5	*74.5	14,677
Aug...	*73.0	..	74.2	..	75.2	..	*76,5	*76.0	..	..	..	*69.0	76.1	79.8	*79.6	*74.9	12,891
Sept. .	*71.4	..	72·8	..	74.1	..	75.5	75.6	..	..	..	66.6	74.0	76.1	76.1	74.0	4,416
Oct...	*64.0	..	65.8	..	67.6	..	69.7	70.8	..	..	..	*55.0	64.7	68.8	71.1	70.6	1.608
Nov. .	*55.4	..	56.5	..	58.4	..	60.3	61.5	..	..	..	*40.5	50.7	58.4	63.7	60.8	0,063
Dec...	*50.6	..	50.8	..	51.8	..	53.3	54.5	..	..	..	*34.5	41.9	49.3	54.4	54.1	1,211

The items marked with an asterisk were taken half an hour later than the hour indicated at the top of the column.

In July, August and September, 1833, the register notes only the minima and maxima temperatures, but to save room I have supposed these to accord with the hours of 7 A. M. and 2 P. M.

Of the two barometers registered at *Katmandhu*, that of the Resident has been preferred, for 1834. Capt. Robinson's tube for that year stood a quarter of an inch lower, and was hardly sensible to the diurnal oscillation. After boiling it in the month of September, however, it rose to within .02 of H.'s, and exceeded the latter in oscillation by .03. This and the circumstance of the hour of maximum 9 to 10 A. M. being unfortunately omitted among the numerous periods of the day selected for register, render not only the absolute amount of diurnal motion still uncertain for *Nipál*, but also prevent our calculating the annual average. I hope the series I am now promised by Dr. A. Campbell for 1837 will supply the want.

I reserve for a separate notice the calculated elevations connected with the *Nipál* series, as they are affected by the error alluded to in the preceding remarks, of assuming 30 inches for the barometric zero at the level of the sea.

The state of the wind in the valley has not been noted, but the fall of rain is recorded with precision, the average amount being about 50 inches.

The series for *Simla* does not comprehend an entire year, and will not therefore furnish averages. The temperature appears to be that of the interior of the house.

Abstract of Meteorological Register kept at Simla, from the 15th May to the 21st November, 1834. *By* S. M. Boulderson, *Esq.*

Month.	Barometer at 32°.			Day tide.	Thermometer.		
	10 A. M.	4 P. M.	10 P. M		10 A. M.	4 P. M.	10 P. M.
May, ...	23.816	.773	.802	.033	74.0	74.5	73.9
June, ...	.784	.723	.774	.061	70.8	70.6	69.2
July, ...	.794	.729	.784	.065	67.4	67.6	66.9
August, ...	.827	.777	.803	.050	68.5	67.9	65.9
September, ...	.908	.832	.872	.076	67.2	66.0	65.4
October, ...	24.013	.942	978	.071	62.6	62.7	58.2
November, ...	.092	.041	.073	.051	57.1	57.5	54.1

The range at 7½ A. M. is also given for the month of May, the mean of the barometer being 23.798; which proves the regularity of the nocturnal tide in these elevated regions.

I must, for want of time, leave to a future opportunity the further analysis of the above tables, and the deduction of general average results from the *Calcutta* tables for the past five years. Meantime, I will conclude with the insertion of a table of the temperature at *Kandy* in *Ceylon*, obligingly contributed by Captain Ord, R. E., and a note on the temperature of the *Brahmaputra* in *Assam*, compared with that of the air at the same time by Dr. W. Griffith.

Extract from a Meteorological Journal kept at Kandy, Island of Ceylon, by Captain Ord, *R. E.*

(To complete the year 1834, broken off in the Extract published in Journal, No. 48, December 1835, page 709.)

Date.	Thermometric Range.							Rain-guage.	
1834.	Monthly Range.		Greatest Range in 24 hours.		Least Range in 24 hours.		Mean.	Rain fallen.	Fallen in 24 hours
Month.	Max. and Min.	Range.	Max. and Min.	Range.	Max. and Min.	Range.	Temp.	In the month. inches.	Max. and Min.
Nov....	81½ / 63½	18	81 / 63½	17½	67 / 65	2	72	30.6	9. 0 / 0
Dec. ..	84 / 57	27	76½ / 57	19½	68½ / 67½	1	70½	4.6	3. 3 / 0

N. B. Highest range in the shade during the year 1834, 88°, lowest 57°, mean temp. 73° 1.

Total quantity of rain fallen during the year, 96.7 inches.

Extract from the same Journal for the year 1835.

Date.	Thermometric Range.							Rain-guage.	
1835.	Monthly Range.		Greatest Range in 24 hours.		Least Range in 24 hours.		Mean Temp.	Rain fallen.	Fallen in 24 hours.
Month.	Max. and Min.	Range.	Max. and Min.	Range.	Max. and Min.	Range.		In the month inches	Max. and Min.
Jan.....	79 / 58½	20½	78½ / 59	19½	72 / 67½	4½	70	8·65	0 7 / 0
Feb.....	85 / 60	25	84 / 62½	21½	78 / 70	8	72¾	0·7	0 7 / 0
March,	84½ / 58½	26	84 / 62½	21½	78 / 70	8	73¼	5·4	2 8 / 0
April, ..	82 / 65½	16½	82 / 66½	15½	78 / 70	8	74	6·2	2 3 / 0
May, ..	83½ / 65	18½	81 / 65	16	76 / 71	5	73¾	3	0 5 / 0
June, ..	80½ / 66	14½	80½ / 66	14½	75 / 70	5	72⅔	4·8	0 8 / 0
July, ..	83 / 64	19	81 / 64	17	75 / 70	5	72¾	2·7	0 7 / 0
Aug. ..	83½ / 64	19½	80 / 64	16	74 / 70	4	72⅔	5·8	0 9 / 0
Sept. .	84½ / 65	19½	84½ / 66	18½	73½ / 69½	4	72	7·15	1 8 / 0
Oct. ..	82 / 65	17	82 / 65	17	70 / 79	1	71	20·6	6 0 / 0
Nov. ..	85 / 54	31	83 / 54	29	76 / 69	7	72	6·8	1 2 / 0
Dec. ..	85 / 62	23	84 / 62	22	78 / 69	9	72½	4·4	1 5 / 0

N. B. Highest range in the shade during the year 1835, 85°, lowest, 58½°, mean temp..... 72·44

Mean of max. and min. for the 2 years, ... 72·125

Ditto of calculated mean temp. for ditto, ... 72·77

(Too high, in consequence of employing the hours of 8 instead of 10.)

Total quantity of rain fallen during the year, 76·2 inches.

Temperature of the Air and of the Water at Sadiyá in Assam, by Dr. W. Griffith.

September, 1836.	6 A. M. Air. In House.	6 A. M. Air. Over Kundeel.	6 A. M. Air. Over Burrumpootur.	6 A. M. Water. Of Burhumpootur.	6 A. M. Water. Of Kundeel*.		2 P. M. Air. In House.	2 P. M. Air. Over Kundeel.	2 P. M. Air. Over Burhumpootur.	2 P. M. Water. Of Burhumpootur.	2 P. M. Water. Of Kundeel.	6 P. M. Air. In House.	6 P. M. Air. Over Kundeel.	6 P. M. Air. Over Burhumpootur.	6 P. M. Water. Of Burhumpootur.	6 P. M. Water. Of Kundeel.	
1	0	0	0	0	0		85	102	100	64	77	83	82½	82	66	79	
2	0	0	0	0	0		76¼	76	75	64	76	76¼	76¼	73	64	75¾	Light fog over B.
3	75	75	68¼	63	73½		83	85	77¾	66	75	82	81	67	66	76	
4	77	77	69¾	64	75		83½	86	78	65½	77½	83	81¾	70	66	77	
5	76	76	69	64	75	Partial fogs over Burhumpootur.	82	93	82	65½	77½	85	85	70	66¾	77	
6	0	0	0	0	0		75	76	75¾	65	76	76	76	70¼	65	76	River B, rising considerably.
7	74	74	68	63½	73¾	Slight and partial fogs over do.	84	86	77¾	65	77	82	80	69¾	65	77¼	
8	76	74	72	64	75¾	Burhumpootur risen two feet.	87	88½	86	67	80¼	0	83¾	74	68	80	
9	74	74	74	67	76		85	87½	86	69	80	83	83	74	69	80	
10	77	76	72	67	77	Slight fogs over Burhumpootur.	86	86	84¼	68	79	0	0	0	0	0	
11	76	76	73	68	77	Partial fogs over do.	82	86½	80¼	69	79	80	81	74¼	69½	78	
12	76½	77	72½	68	76	River falling.	83	86	82	68	78	0	0	0	0	0	
13	77	76½	75	67	75½		85½	90	84	69	79	83	81½	76	69	78	
14	76	76½	80	66	74½	General fog over do.	86	84	86	69	80	83	83	74	70	80	
15	77	76	72	68	76		87	91½	85½	70	80	86½	82½	75½	70	80	
16	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	
17	76	76	70	67	76½	Slight fog over do. *Considerable*	87	92	82	69	81	0	0	0	0	0	
18	79	77½	72	67	77	*rise.*	88½	94	92	69	81½	87½	86	79	70	81½	
19	74	74	72	67	76¼		83	87	80	68	80	0	0	0	0	0	
20	76	75	71	66½	75½	General fog : thickest over B.	84	86½	83	69	79	0	76¼	74	68	78	
21	76¼	76	71½	67	76		78	80½	79	68	76¼	77½	76	72½	68	76¼	
22	74	75	76½	66	74	Rise in Burhumpootur of 2 feet.	84½	85	84	68	77½	0	0	0	0	0	
23	73	75	74½	66	75	Fall of Burhumpootur, slight fog	85	89	86	68	80	83	82	74½	68	79½	
24	76½	75	71	67	76	over do.	86	92	84	69	80	86	82½	73½	69	80	
25	74½	74	69½	67	76		85½	91	87	69	80	86	82	73½	69	80	
26	72½	72	74	67	76		86½	91	85	69½	80	86	83½	73	68½	80	
27	0	0	0	0	0		0	0	0	0	0	86½	82½	76	68¾	80	
28	76	75	72	67	75½		0	0	0	0	0	84	82	74	68	78	
29	0	0	0	0	0		0	0	0	0	0	82	79	77	67	77	
30	75½	75	69	65½	74½		83	84	83	67	77½	82½	80	75	67	77	

* The Kundeel is a small nullah joining the Burhumpootur at Sadiyá.

Taken with a Thermometer, graduated in scales of 2 degrees each; the instrument was nearly immersed in the water. The temperatures of both rivers are taken some distance from the banks of the Burhumpootur at about 40 yards. Scarcely any difference, however, is to be found between the temperature at some distance out and that near the banks.

XIV.—*Postscript to the Memoir on the Depression of the Wet-bulb Thermometer, published in the July number. By* Jas. Prinsep, *Sec. &c.*

I have only found leisure to repeat the experiments forming the final section of my former paper, on one more of the simple gases, namely oxygen; of which the specific heat, calculated from the data thus supplied, has not been found to differ materially from that of common atmospherical air. It follows necessarily, that azote must have the same specific heat, since the mixture of the two causes no alteration in the observed depression. The experiments were conducted in the same order as before, except that the glass exit tube was somewhat narrower, and the dry thermometer was fixed in it half an inch below the wetted bulb. Some trials, with common air, were first made to ascertain whether this arrangement produced any material difference of result.

Depressions with Oxygen gas.

	Bar.	t	t'	d	h	Max. dep. for hyg.	Tabular max. dep.
		°	°	°			
Sept. 21 Common air,	29.65	92.0	55.0	36.8	6 ?	39.0	37.2
Oct. 2 Ditto,	29.78	83.8	51.6	32.4	0	32.4	32.7
4 Ditto,	29.75	89.5	54.3	35.2	0	35,2	35,7
11 Oxygen,	29.81	82.0	51.4	30.6	2	31.2	31.8
21 Ditto,	30.00	81.2	53.4	27.8	2 ?	28.3	31.4
Nov. 3 Ditto,	29.90	82.8	52.1	30.7	0	30.7	32.1
5 Ditto,	29.88	83.4	52.2	31.2	0	31.2	32.5

In the first experiment it is evident, that the hair hygrometer had not reached its full contraction for the actual siccity of the air enclosed in the gasometer. The trifling inferiority in the depressions for oxygen, I am inclined to attribute to the more sparing hand with which it was expended:—the difference of four per cent. is certainly larger than ought to be conceded to experimental error, but I feel sure that a more careful and longer series would have brought out a nearer approach to the depressions observed in common air.

XV.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 4th January, 1837.

The Honorable Sir Edward Ryan, President, in the chair.

Messrs. W. Dent and M. Manuk, proposed at the last meeting, were ballotted for, and duly elected Members of the Society.

Captain Edward Sanders was proposed by Major Taylor, seconded by Mr. W. H. Macnaghten.

Mr. JOHN CURNIN was proposed by the Secretary, seconded by Mr. BAGSHAW.

Captain F. JENKINS, proposed by the Secretary, seconded by Sir E. RYAN.

Mr. GEORGE HILL, proposed by Dr. PEARSON, seconded by the Secretary.

Mr. RICHARD WALKER, proposed by Mr. BELL, seconded by the President.

Bábus RA'MNA'TH TAGORE and PRASANNAKUMA'R TAGORE, proposed by Bábu RUSOMOY DUTT, seconded by the Secretary.

Mr. P. A. LAIR was proposed a corresponding member by Mr. JAMES PRINSEP; the nomination was referred to the Committee of Papers.

The meeting then proceeded to the annual election of office-bearers, when the following gentlemen were elected.

Vice-Presidents.

Sir JOHN P. GRANT, Sir B. H. MALKIN, the Rev. Dr. MILL, W. H. MACNAGHTEN, Esq., H. T. PRINSEP, Esq.

Committee of Papers.

J. R. COLVIN, Esq., C. E. TREVELYAN, Esq., Capt. PEMBERTON, Capt. FORBES, D. HARE, Esq., J. T. PEARSON, Esq., Dr. WALLICH, Capt. CUNNINGHAM, RAMCOMUL SEN.

The Secretary read minutes from the Report of the Committee of papers on the Honorable Mr. TURNOUR's proposed publication of the *Mahávansi.*

Minute by Dr. MILL.

In presenting to the world both the text and the translation of these extensive historical works—and in thus rescuing them from what is in many respects worse than total oblivion, the confusion and misapprehension of their real testimony which a former very erroneous publication on the subject in England was calculated to produce,—Mr. TURNOUR would have conferred a very great benefit on the historical literature of the East, had his merits even stopped at this point, and had he not further shewn by his comments, how admirably qualified he is to illustrate the work he edites, and enable every reader to profit by its contents. The literary benefit is very far from being confined to the single subject of Ceylon: it extends to the whole of India: and yields in importance to nothing that has yet been produced on that most perplexed and generally unproductive subject, the history of India prior to the thousandth year of our era.

How these documents bear on the general history of the country, will be very evident to any one who follows the able editor in his preliminary remarks, as well as in the specimen he has already given us of the first book of his series, the *Mahávansi.* It is enough to remark, that the peculiarly interesting connexion between the history of *Ceylon* before the Christian era, with that of *Magadha*, or that part of Northern India which we now call *Behar*, is attested by the

very language* in which all these books are written: and that it originates with what is undoubtedly the most striking and important moral phenomena in the history of *Eastern* Asia, the rise of Buddhism from the centre of that great Gangetic kingdom. And it is observable, that the same dynasty of sovereigns of that large district, reigning at *Pataliputra*, or *Palibothra*, the present *Patna*, —from the midst of whom Gautama Buddha arose nearly six centuries before our Lord,—presents us not two centuries afterwards, in the age of Alexander and Sandracottus with the one solitary point in which the history of India

* The *Pálí* in which these historical books are written, and which is the language of Buddhist literature and religion, as well in *Siam*, *Ava*, *Nipál*, and *Tibet*, as in *Ceylon*,—is in fact no other, as Mr. Turnour shews, and the text of his originals exhibits to every Sanscrit scholar, than the *Magadha Pracrit*,—the classical form in ancient *Behar*, of that very peculiar modification of Sanscrit speech which enters as largely into the drama of the Hindus (though in a different way) as did the Doric dialect into the Attic tragedy in ancient *Greece*. Now, all the variations of Sanscrit words that occur in these Pracrit dialects, answer closely to the forms which the same words exhibit in the vernacular Hindui of that province, and the yet more northern districts of India, as far as the Himálaya: (e. g. the omission of the *r*, the changing of *bh* to *h*, &c. &c.) and are totally unlike the forms of the same words even in the province of *Bengal*, or as infused into the languages of the Southern peninsula, and of *Ceylon* itself. And whenever corresponding words in the *Pálí* and *Singhalese* occur, as they do every where, I believe it will be invariably found that the *latter*, (the vernacular words of the people of the Kandian and maritime provinces of *Ceylon,*) *resemble most closely* the Sanscrit original of both :—whereas the former, the sacred language, takes in all words that admit of it, the same sort of peculiar variation which belongs to the tongues of northernmost India,—shewing evidently that it was *thence*, and not from *Ceylon*, that the peculiar language as well as institutions of Buddhism came to the island,—as the *Mahávansi* itself distinctly asserts. To take but one out of the many instances that might be alleged, we may give one of the most remarkable and early names of the island, viz *Tamba-pannyo*, as the Pálí name is given in p. 35 of this specimen of the *Mahávansi*, viz. the "copper-palmed;" in Sanscrit *Tamra-páni*. Now this Sanscrit form, so different from the Palí, is actually the present Singhalese for the same thing, as I was assured by a competent scholar on the island: and a very convincing proof that it has ever been so, may be seen in the name by which the island was universally known to the ancients and to Cosmas Indicopleustes when he visited it, viz. *ταπροβανη*. The Greeks would be just as unlikely to introduce this *r* where it did not exist, as any other languages of India beside the northernmost ones would be to drop it where it before existed: but this is a universal character of the Pracrit and of the present Hindui, (as seen in this word, *tamba*, copper—*kám* "work" for *karm*, &c. &c. &c.)

This real origin of the celebrated name *Taprobane* (whatever may be thought of the story connected with it in the *Mahávansi*, and which may seem with greater probability to have arisen from the *tamra-varna*, or *copper colour*, of its southern cliffs near *Matura*, so well known to navigators)—is one of the points of curious and interesting information which we owe mainly to this publication of Mr. Turnour. Whatever had been before suggested as the probable origin of that name, so little now known except in these Buddhistic books, as one of the proper names of the great island of *Lanca* or *Singhala-dwipa*, was in the highest degree forced and improbable, (ex. gr. the Hindví *Tápú-Raban*, or the island of Rávana.)

coincides with that of Western Asia and Europe, from which in every other point (before the Mahometan conquest) it is so remarkably and totally separate.

The great value of these works, as containing correct chronological history, is well established from this unerring test by Mr. TURNOUR. And he most ably vindicates the Buddhist authors of *Ceylon* at least, from the general censure passed on them by Professor HORACE WILSON,—in reviewing the Tibet documents of M. CSOMA KÖRÖSI,—of being, if possible, more regardless of chronology than even the Bráhmans. The degree of accuracy, indeed, with which, in the midst of this long series of kings, the age of CHANDRA-GUPTA MAURYA is marked,—even admitting an error of sixty years from his proper age, as a contemporary of ALEXANDER and SELEUCUS,—is yet most wonderful, when compared with the only other chronological Indian history yet produced—the history of *Cashmír*, called the *Rája Taranginí*, (which we owe to the eminently learned orientalist just named,) whose lists would go to antedate that celebrated king by nearly twelve centuries.—On all these points, Mr. TURNOUR'S observations are very valuable: and even when they may fail to produce conviction (as in some parts of the dissertation inserted in the Journal As. Soc. of September last), the learning and candour with which he prosecutes the inquiry, and the absence of all undue prepossession in favor of those authors with whom he is necessarily most conversant, ever entitle them to the utmost consideration.

It would be undervaluing these works to suppose them to be merely a dry chronological catalogue of sovereigns and dynasties: though this is frequently all that an inquirer into ancient India is able to meet with; where, between fable on the one hand, and the strong national tendency to abstract speculation on the other, the literature of the country has so little to aid a *historical* student. These works apparently contain much that may well be deemed valuable by a philosophical inquirer into history: and the details, in particular, of the contest between the antagonist principles of Bráhmanism and Buddhism, are often curiously illustrative of the genius of these two systems, which have held, and still hold, such sway over large portions of mankind.

W. H. MILL.

Minute by the Secretary.

Fully subscribing to the eulogy recorded by our Vice-President on Mr. TURNOUR'S labours, which all who have read his specimen-volume and preliminary treatise will acknowledge to be most just and well deserved, I have merely to notice, that the typographical execution of his Pálí text in Roman character has been examined by a competent native scholar residing in *Calcutta*, and found to contain but a trifling list of errors, and those chiefly of the accented letters. There are blanks in the manuscript which it might be possible to restore by collation with the copies of the *Mahávansí* in the Burmese character, easily procurable at *Ava*. I have sent the specimen to Colonel H. BURNEY, who will, doubtless, be happy to contribute his collateral aid to this meritorious undertaking.

An opportunity has lately fallen in my way of verifying a portion not of the great Pálí History, but of its Singhalese continuation translated in Mr. TURNOUR'S Tabular Epitome of Ceylon Dynasties. Captain ORD having lately

called my attention to the form of a letter* on one of the ancient coins of Dambadinna hitherto but imperfectly decyphered, at the moment when I was transcribing a *Delhí* inscription of the eleventh century; the form of other letters struck me as very similar to that type, and hence, on re-examining all the coins I possessed, and the drawings of others sent me by Captain Ord, I was forthwith enabled to recognise the names of no less than six kings, all occurring in Mr. Turnour's list within the two centuries immediately subsequent to the *Sholian* conquest†, and thus forming a chronological link with one of the dynasties of Southern India, which has been but very imperfectly lifted from obscurity by the researches of Colonel Mackenzie and others in India proper.

J. Prinsep.

The Society concurring entirely in the Committee's view of the value of Mr. Turnour's intended publication, particularly in regard to the light it throws on the early history of India, it was resolved to advocate its patronage by the Government of India, to the fullest extent that it may have been usual for Government to subscribe to private enterprizes of similar importance in India itself.

Library.

The following books were presented.

Catalogue of 7385 Stars, chiefly in the southern hemisphere, by Mr. W. Richardson—*presented by the Lords of the Admiralty.*

Memoires de l'Academie Royale de Caen, 1825—1829.

Annuaire du Calvados for 1833-34-35, 3 vols.

Essai sur les Combustions Humaines, par Pierre-Aimé Lair, 1 vol. (3 copies) and various tracts, essays, notices, by Mr. Lair and other Members—*presented by the Royal Society of Caen.*

Memoires sur La Conformité Organique dans L'Echelle Animale par Ant. Duges—*presented by Mons. J. C. Villaire, Surgeon of the French Corvette Aube.*

Ward on the Hindus, 2 vols. (purchased.)

Extract of a letter from Dr. Walne to Captain Crawfurd (recently arrived from *Egypt*) was read, expressing a desire to place the Literary and Antiquarian Society at *Caïro*, instituted by himself, in correspondence with the Asiatic Society of Bengal.

The Secretary stated that he had opened the desired intercourse by addressing to Dr. Walne copies of the Arabic works printed by the Society, and of the Ethiopian inscriptions printed in the Journal, in hopes of their being decyphered.

Museum.

A variety of specimens of Native ornaments were presented by Bábu Herambana'th Tha'kur.

* The first letter of the 3rd line in the coin fig. 22 of Pl. L., in vol. iv. which was read *tr*, but ought to be *h*, being joined on the left and open on the right.

† Srí Vijaya Vahu 1071, Srí Parákrama Vahu 1153, Srí rája Lilavatí 1197, Srí Krithi Nikanga 1187, Srí mat Sahása Malla 1200, and Srí Lokèswara 1210.

Physical.

Extracts of letters from Lieutenant G. Fulljames and Captain A. Burnes were read, announcing the dispatch of further fossils from *Perim*, in the gulph of *Cambay*.

Mr. H. Walters presented a very large fragment of a fossil tree from *Birbhúm*, upon which there appeared a cut as of a hatchet, made before the wood was petrified. (?)

A letter was read from M. Jules Desjardins, dated Maurice 29th September, 1836, forwarding meteorological observations made from April to August inclusive, and promising to continue the series if acceptable.

A note from Dr. Spilsbury explained that the large fossil acetabulum of the elephant, presented at a former meeting, was not found at *Segouní*, (whence the femur of 1834 was extracted,) but from the hill close to *Jabalpur*, which Captain Sleeman first brought to notice. The positions, therefore, of these large fragments were 60 miles asunder.

Another fragment on a still more gigantic scale, the lower end of the humerus, was now presented: and Dr. S. announces three more large fossils on their way to *Calcutta*, from two spots visited by Major Ouseley.

The skeleton of the *Sumatran* Orang-otang which lately died in Calcutta (wanting the hands and feet) was presented by Mr. R. W. Frith.

A large ostraceous shell was presented by the Rev. M. Hill.

The Secretary read his Report on the past year's proceedings, of which the following is the substance.

The number of new Members added to the list in 1836 had been

Ordinary Members,	24
Associate Members,	2
Honorary Member,	1
The loss by death, 2; by departure to Europe, 1; and withdrawal, 3; in all	6

The financial operations of the year were as follows:

Payments.

To house establishment and contingencies, from December, 1835, to October, 1836,	2969	11	5
To salary of the Curator, and museum contingent, from December, 1835, to 30th November, 1836,	2591	14	0
To copies of the Journal supplied to the Members to 31st December,	1088	0	0
To Sheriff and Co.'s bill for repairs,	311	11	8
To matting the hall and part of the museum with ratan,	155	3	6
To new almirahs, shelves, tables, &c.	533	11	4
	187	9	6
To Orphan Press bill for printing 1st part, 20th vol., including authors' copies, &c.	1871	13	4
To lithography and printing plates of Physical volume xix.	524	12	9
To freight to Madras, &c.	17	1	0
Total,	10,251	8	6

Outstanding Bills due.

For the XIXth vol. 1st part, with authors' extra copies,	1646	8	8
For Journal supplied to Members,	1284	0	0
Establishment, Curator, &c. 2 months,	1150	0	0

Receipts.

By balance of past year's account, Sa. Rs. 380 15 2, or	406	5	6
By quarterly collections and admission fees realised,	6551	9	9
By 3rd Dividend on the Estate of Mackintosh and Co.,	382	13	7
By Government for establishment retained by the Society for keeping in custody the Oriental books transferred from the College of Fort William, from April to November, 1836, at 78 per month,	624	0	0
By Interest on Government Securities deposited with the Government Agent,	2093	0	4
By balance in deficit,	193	11	4
Total,	10,251	8	6

Contributions due.

3rd Quarterly Subs. to Sept.	1705	1	5
4th Ditto —— to Dec.	1280	0	0

Oriental Publications.

Payments.				*Receipts.*			
To paid several bills for printing Sanscrit and Arabic,		6900	8 6	By cash balance of last year,		118	10 2
To Pandits and Maulavís for correcting press,		160	0 0	By amount realised from public subscriptions to the Alamgirí,		5786	10 8
To writer and cashier,		150	0 0	By private subscriptions for that and other works realised,		2909	2 8
To expense of removing College Library, and sundries,		18	10 6	By sale of books,		615	8 7
To purchase of four book cases from the Education Committee,		59	11 8	By ditto to Education Committee,		504	0 0
To cash realised by sale of Inaya, transferred to Ramdhan Sen, on his engaging to complete the work,		300	0 0	By establishment for care of books allowed by Government for March, (afterwards entered in general account,)		78	0 0
To freight to Europe, packing, &c.,		192	15 7				
To postage, cooly hire, &c.		55	9 3				
To balance in hand,		2174	8 7				
	Co.'s Rs.	10,012	0 1		Co.'s Rs.	10,012	0 1
Outstanding Bills due to the end of 1836,		2204	9 11	Subscriptions to be realised for works delivered, say,		1000	0 0

"The publications by the Society and under its auspices have been this year unprecedentedly numerous. Of the Researches, two half volumes have been completed, one literary and one physical: the latter containing no less than 21 plates. Thirty, indeed, have been engraved, but nine are necessarily kept back, from the text being yet unfinished. It is my duty to bring to the notice of Members in what manner I have been enabled to publish so many finished plates, engraved in a style much superior to those of former volumes, without entailing an expense much beyond that of the paper on which they are printed.

"The lithographs of the snakes and some of the botanical plates were kindly drawn by Dr. CANTOR; the remainder of the latter by the artists of Dr. WALLICH'S establishment: one or two have also been executed by myself: but by far the greater portion, including nine mezzotinto and six line engravings, have been executed on holidays and at early leisure hours, by KA'SINA'TH, the chief die engraver of the Mint, who most liberally refuses to accept any remuneration for them, considering himself under some little obligation to the Society and to myself for having brought his talents to notice. I trust the Society will testify in an appropriate manner their acknowledgment of such a disinterested and noble act.

"Besides these works, the Society has witnessed in the course of the past year, the completion of the Fatawa Alamgírí, the second volume of the Mahábhárata, (of which the third volume is also far advanced,) the Rája Tarangíní, the Susrúta, the Naishadha, and the Anis ul Musharrahín, leaving only the remainder of the Mahábhárata and a few pages of the Khazanat ul Ilm, to be accomplished, of all the works transferred from the Committee of Public Instruction*.

"Collaterally the Society has taken under its auspices the publication of the Cochin-Chinese Dictionary, of the Alif Leila, and of an Anglo-Burmese Dictionary of which the manuscript ordered to be printed under the patronage of Government, has been placed in my hands by Mr. LANE its compiler, on his departure for England; meantime our representative in England, Professor WILSON, is engaged in passing the MOORCROFT journals through the press at the risk and credit of the Society.

"In this sketch I do not allude to the journal and the appendices published therewith, although it must be well known to all that this work owes its principal and most valuable contributions to its acknowledged connection with the Society.

"In reference to the expectation held out in last year's report, the Government

* The Inaya has been transferred to the Editor, Bábu RA'MDHAN SEN, under agreement that he should complete it.

has, in the course of the present year, transferred to the Society the two branches of the Oriental Library of Fort William, manuscripts and printed works, and has liberally granted a monthly allowance for their preservation. Further donations of a valuable nature have been made by the French Government; the Lords of the Admiralty, the Commissioners of Parliamentary Records, (through the Government,) and by Dr. LUMQUA and other private individuals, in addition to the customary tribute from the learned Societies of Europe and America.

"The Museum has continued to increase rapidly; but its means of doing justice to objects presented has been limited for want of funds. The fossils particularly require more cabinets and more space. Captain CUNNINGHAM'S present of Sárnáth sculptures forms the chief object of notice in the antiquarian museum. Depredations to an unfortunate extent have been lately made by some of the servants of the house, in articles ornamented in silver and gold; which the Librarian partly attributes to the opening of the rooms at so early an hour. Inquiry is now pending at the police, and measures must be devised for better securing our increasing property.

"Some propositions have to be submitted for the publication of further oriental works—but the first to which I would beg the Society's attention are the catalogues of the College manuscripts which have been prepared for the purpose by the Pandit and Maulaví in their respective languages. To the former of these I would recommend that Mr. HODGSON'S revised catalogue of Buddhist works extant in *Nipál* should be added.

"There are in the Society's portfolios a considerable number of original drawings and inscriptions, (besides several bound MS. volumes of the MACKENZIE drawings) which it would be extremely desirable to publish at the present time, when an effort seems to be simultaneously making in India and in Europe to read the history of ancient India through the medium of her monumental records. The Ceylon portion would serve to illustrate the great work upon which Mr. TURNOUR is engaged; while those of the peninsula would form an appropriate appendix to the review of the MACKENZIE MSS. at Madras, which the Society has recommended to be undertaken by Mr. TAYLOR. Were a single competent native draughtsman added to the Government Lithographic Establishment, this object might be attained at a comparatively trifling cost: and I think it would be worthy the Committee of Papers to suggest some measure of the sort to the present Ruler of India, who has accepted, not as an idle honor, the high post of Patron to our Society.

"The last act of the past year has been the establishment of a Committee for statistical inquiries, of the success of which it is yet too early to speak, but not too early to augur well from the known zeal of those who have undertaken the Herculean task."

An application signed by all the students of the Sanscrit College, for the Society to print the *Magh kávya* (of which the edition published by Mr. COLEBROOKE some years ago is now extinct) was referred to the Committee of Papers.

The same measure was taken regarding an application from MADHUSU'DANA GUPTA pandit, in favor of printing the Sanscrit translation of HOOPER'S Vade Mecum, suspended by the Education Committee.

Fifty copies of the Susrúta (2 vols.) were voted to MADHUSU'DANA for his trouble in correcting the proofs of that work.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of December, 1836.

Day of the Month.	Observations at 10 A. M.							Calculated Humidity.			Observations at 4 P. M.							Calculated Humidity.			Register Thermometer Extremes.		Rain.	Wind.		Weather.	
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb	Do. by Leslie's Hygro.	Dew point.	Hair Hygrometer.	Centesimal tens. of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	New Standard Barometer.	Old Stand. Barometer at 32°.	Thermometer in air.	Depression of wet-bulb.	Do. by Leslie's Hygro.	Dew-point.	Hair Hygrometer.	Centesimal tension of vapour by wet-bulb.	Ditto by dew-point.	Do. by hair Hygrom.	Cold on roof	Heat in sun.		10 A. M.	4 P. M.	Morning.	Evening.
1	30,032	30,082	72,1	8,3	8,3	48,5	86,0	57	46		29,823	29,994	77,1	12,5	11,8	48,3	82,0	44	38		55,2	89,0		N.W.	N.	clear.	fine.
2	,042	,094	72,0	9,8	9,6	47,8	84,0	50	44		,927	,998	76,3	13,0	11,7	48 4	81,0	40	40		54,5	94,0		N.	N.	do	clear.
3	,052	,098	71,3	7,9	8,2	47,3	85,0	60	45		,906	,974	75,9	11,5	10,3	46 8	83,	47	38			106,0		N.	N. E.	do	cumuli.
4	,045	,090	71,3	7,9	7,5	55,0	82,0	60	58		,943	30,000	76,1	11,9	10,7	53 0	73,	45	47		53,8	93,0		N.	n.	do	clear.
5	,095	,127	69,9	5,8	6,4		88,0	69			,991	,042	75,7	12,6	11,7	54.5	81,	42	50		52,0			N.	N.	do	do
6	,125	,164	70,7	6,1	6,2	54,3	87,0	67	58		30,006	,064	75,5	14,0	12,7		80,	35				99,0		n.	N.	do	do
7	,144	,180	70,2	5,9	5,8	54,2	88,0	67	58		,022	,076	75,7	13,0	12,0	47,0	82,	40	38		53,5	90,0		w.	n.	do	do
8	,120	,160	70,0	5,8	6,0	54,2	86,0	69	59	70	,001	,057	74,6	11,3	10,3	50.3	76,	45	44	52	54,0	101,0		n.	n.	do	fine.
9	,108	,146	70,5	6,5	6,6	50,0	85,0	65	45	68	29,981	,040	76,0	11,8	10,7	49,7	74,	45	42	49	54,2	95.5		n.	ne.	do	clear.
10	,091	,134	79,5	6,7	6,4	50,5	85,0	65	53	68	,976	,032	75,1	12,6	11,1	51,0	73,	39	45	48	56·2	97,2		n.	n.	do	clear.
11	,063	,100	69,1	8,9	8,3	53,0	79,0	52	58	57	,945	,000	74,2	13,0	11,1	49,0	73,	39	43	48	54,2	88,0		n.	n.	do	do
12	,053	,096	68,9	9,7	9,3	49,2	78,	50	52	56	,932	29,987	74,0	12,7	11,3	49,1	72,	40	44	46	51,0	90,0		n.	n.	do	do
13	,043	,083	68,3	8,7	8,7	50,0	79,	52	54	57	,956	,963	74,3	12,7	11,3	49,0	72,	40	43	46	51,2	80,2		ne.	ne.	cirri.	do
14	,036	,076	68,5	8,1	7,7	53,5	81,	55	61	61	,915	,792	74,3	12,0	10,7	50,5	76,	42	45	52	52,0	95,0		N.	nw.	clear.	do
15	,038	,078	69,0	7,6	7,1	52,5	82,	60	58	63	,914	,973	73,8	11,0	10,0		76,	45		52	54,0	90,0		nw.	N.	do	do
16	,027	,064	68,9	6,3	6,1	53,5	86,	65	60	70	,906	,964	73,9	10,6	9,8	48,0	77,	50	41	54	53,0	95,4		n.	n.	do	cumuli.
17	,049	,087	67,5	6,3	6,3	53,0	84,	65	61	66	,887	,946	74,2	13,9	12,9	47,8	71,	35	42	45	50,0	87,0		nw.	nw.	do	clear.
18	,022	,062	67,6	9,4	8,9	48,2	77,	50	52	54	,887	,946	73,8	12,0		52,0	73,	42	49	48	47,5	96,8		N.	nw.	do	do
19	,066	,098	67,9	6,3	5,7	54,3	84,	65	63	66	,908	,959	74,9	10,3	8,3	52,2	78,	50	47	56	52,0	102,8		N.	nw.	do	do
20	,011	,048	69,5	5,1	5,6	52,0	84,	70	56	66	,869	,926	76,3	11,6	11,0	49,3	76,	45	41	52	53,0	96,5		N.W.	n.	do	cumuli.
21	,017	,061	71,4	7,7	7,4	52,2	81,	60	53	61	,883	,941	75,7	10,6	9.6	53,2	77,	50	47	54	53,0	106,0		N.W.	ne.	do	clear.
22	,005	,045	70,7	6,8	6,8	51,9	84,	65	53	66	,903	,960	75,8	11,4	10,4	51,6	76,	47	44	52	53,5	98,0		N. E.	N.	do	do
23	,007	,046	70,7	6,6	6,3	51,0	84,	65	52	66	,876	,936	75,8	11,3	10,2	52,6	74,	47	46	49	52,5	110,0		N.	ne.	do	do
24	,008	,046	71,9	8,1	8,1	51,6	82,	60	52	62	,882	,949	77,9	12,9	5,2	54,0	72,	42	46	46	51,2			nw.	n.	do	do
25	,013	,046	69,1	6,9	7,0	56,5	81,	62	66	61	,890	,948	75,2	12,4	10,7	53,3	73,	42	49	48	50,0	91,1		se.	ne.	do	do
26	,030	,046	69,9	7,9	7,3	52,3	82,	60	56	63	,898	,946	74,8	11,0	10,0	52,5	74,	42	48	49	52,0	98.0		n.	N. E.	do	do
27	,130	,106	69,3	9,5	8,9	48,0	77,	50	49	54	,951	30,002	76,1	12,9	10,9	50,6	71,	40	42	45	51,4	92,7		nw.	n.	do	do
28	,194	,162	69,9	7,5	7,1	54,8	81,	60	67	61	30,015	,060	75,6	11,9	10,0		73,	45		48	52,2			N.	n.	do	do
29	,124	,213	69,8	9,7	8,7		78,	50		56	,033	,075	73,9	13,4	11,5		70,	37		44	51,5	92,		N.	N.	do	do
30	,024	,144	65,6	8,9	6,3	52.8	78,	50	64	56	29,954	29,999	73,3	13,9			69,	35		42	43,0	80,		N.	nw.	do	do
31	,029	,048	65,3	9,6	9,0		78,	45		56	,889	,934	73,2	14,7	15,0		68,	30		41				nw.	nw.	do	cirri.
Mean,	30,060	,098	69,5	7,6	7,3	50,0		59			29,931	29,989	75,1	12,2	10,7	50,5		42						N.	nw.	cirrocumulus	hazy.
																								gentle	N.	clear but not cold.	

The difference of the old and new Barometers this month, has been 038 and 058 at 10 and 4 o'clock respectively. The failure of the American ice towards the close of the month suspended the observation of the dew point. A fresh supply has since arrived. The hair hygrometer is a new instrument not yet very correctly graduated.

INDEX.

	Page
Abdallahs, Story of the two,...	590
Abors and Mishmís, ...	195
Address, the Rev. J. Wilson's, to the Bombay Society, ...	304
Adi Buddha,.....	83
—- Prajna, or Dharma, ...	85
—- Sangha, ...	88
Aiswarika System, ...	75
Ajanta, description of Caves at,..	557
Alexander, conjectures on march of, ...	387
———, place of his passing the Indus, ...	472
Alexandria ad Caucasum, conjectures on, ...	8
Alif Leila, complete manuscript of, to be published, ...	514
Alphabet of Ahom and Khamti,..	757
Anahid, distinguished from Nanaia, ...	267
Antimony, Ores of, at Moulmein,	272
Antiquities of Bámián, ...	707
———- described, by Bombay Society,.....	311
Arabian Nights' Entertainments,	514
Arabic Nautical Instruments, ...	784
——— Work on Navigation, ...	441
Ardokro Coin, imitations of, ...	643
Armenian Church, Sketch of, 136,	153
Armenia, Hindu Colony in, ...	331
Armenian Era, origin of, ...	384
Arts of Nepál,.....	219
Asiatic Society, Proceedings of, 52, 124, 189, 245, 302, 371, 433, 509, 587, 672, 753, ...	823
Asírgarh, seal found at, ...	482
Asoka, period of his reign,.....	521
Assam, Fossil Shells of, ...	519
——-, mountain tribes of, ...	193
Avdall, J. memoir of Nierses by,	129
——— note on Nanaia,.....	266
——— on Hindu Colony in Armenia, ...	331
——— on Armenian Era,....	384
Bactrian Coins, new varieties, 11, 20, 537, 548,.....	720
Baker, (Lieut.) on Dádúpur fossils,.....	291
——— on the Fossil Rhinoceros,	486
——— on Fossil Carnivora,....	579
——— on Fossil Sus,.....	661
——— on Fossil Quadrumana, ..	739
Balloon, ascent of, at Calcutta,..	255
Bamiana, extensive ruins near,..	390
———-, inscription at,.....	188
———-, antiquities of, ...	707
Bangalore, climate of, ...	296
Barometer, error of new standard, ...	244
———-, horary observations of, ... 51, 243, 298, 299,	300
———-, influence of moon's declination on,.....	585
———-, comparative range in various places, ...	816
Barrow, H. horary observations by, ... 51,	243
Basaltic tract near Nagpur, ...	110
Basilosaurus, a new Fossil, ...	254
Bauddha worship, classified objects of,.....	94
Beghrám, on ancient coins of,..	1
———, Tope and City of, ...	5
Benson, W. H. on Silhet Land Shells, ...	350
———-——— on Silhet Fluviatile shells, ...	741
———, on Nematura,.....	781
———, on Pterocyclos, ...	782
Bhitari Láth, inscription on, ...	303
———-———, description of, ...	661
Bhopal, copper-plate grant from,	377
Bhotian Banner Inscription, translation of, ...	264
Bland, W. on Trincomali inscriptions, ...	554
——— on geological specimens, ...	575
——— on Pterocyclos, ...	782
Blundell, E. A. on Tenasserim States, ... 601,	688
Bombay Asiatic Society, anniversary address to the,.....	304
Books, Chinese list of, ...	247
Boring for Water, report on, ...	374
Botanical discoveries in Assam,..	674
Botany of Silhet, ...	570
Bráhmanism older than Buddhism, ...	31
Bridge, Suspension, at Tribourg,..	318
Brownlow, C. on fresh water in the Ocean,.....	239
———-——— proposition regarding Alif Leila,.....	514

Page

Buddhas, Ceylonese enumeration of, ... 321
Buddhism, quotations from Sanscrit authors on, ... 28, 71
Buddhist images discovered at Tagoung, ... 157
Burmese Chronicles, extracts from, 163
——— Books, catalogue of, ... 247
BURNEY, Col. on Tagoung images, 157
BUTLER, (Dr.) on preparation of opium, ... 165
CAMPBELL, Dr. A. models presented by, ... 126
——————— notes on Nepál arts by, ... 219
Cashmir, notice of Vigne's travels in, ... 56, 57
———-, Hugel's visit to, .. 184, 303
Catalogue of Colvin fossils, ... 179
CAUTLEY, P. T. on the Sivatherium, ... 38
——————— on Mastodon teeth and head, ... 294, 768
Cavelly Venkata, proposition by, 436
Census of the town of Gaya, .. 373
Cervus Duvaucellii, ... 240
Ceylonese inscriptions, ... 554
CHANDRA-GUPTA, his epoch fixed, 526
CHESNEY, Col., on Euphrates expedition, ... 675
Chærotherium, a new fossil Genus, 127
Chinese Books, catalogue of, ... 246
Chronology, Buddhist, examined, . 521
Cochin Chinese, Dictionary of, 374, 433
Coins, 2nd memoir on Beghram, 1
———-, Grecian series of Bactria, 11
———-, of Nysean Kings, ... 20
———-, Indo-Scythic..... 27, 267
———-, Sassanian, ... 28
———-, of Ardokro reverse, .. 58, 643
———-, Beghram, 3rd memoir on,..... 537, 547
———-, new Bactrian, ... 548, 720
———-, new Mithraic, ... 639
———-, Gupta, Hindu series, ... 647
(See also note in errata.)
COLVIN, Lieut.-Col., Fossils presented by, ... 58, 179
Columba, new species of, ... 122
Compass, division of Arabic, .. 788
———-, used by Maldíves, ... 793
CONOLLY, A. on Sambhur salt,.. 798
Concan, geology of, ... 761
Conversazioné at Govt. House, .. 682
Copper, its action on ink, ... 317
Cotton, soil suitable to, ... 314
Cottons, catalogue of Nepálese, 224
Cotton of Nepál, quality of,..... 369
COURT, M. on Alexander's march, 387
——— on Province of Taxila, 468

Page

CSOMA DE KÖRÖS, A. on Bhotian banner, ... 264
——————— translation by, 384
Cunningham, A. on Ardokro coin, 58
————————, on Bhitari Láth, 303
————————, on Sárnáth Sculptures, ... 588
DAWE, Mr., Fossils presented by, 184
Demetr, a Hindu Idol, ... 337
Diamond District of Cuddapa, .. 111
DURAND, Lt. on Dádúpur fossils, 291
——— on Barometer, ... 301
——— on Fossil Rhinoceros,.. 486
——— on Fossil Carnivora, .. 579
——— on Fossil Sus, ... 661
——— on Fossil Quadrumana, 739
Dyeing, art of, in Nepál,..... 219
Elephant's Tooth, carved, ... 248
Elk, Gigantic, of Himálayas,.... 184
Era, Armenian, ... 384
Euphrates Expedition, Report on, 675
Eurinorynchus Griseus, Specimen, ... 127
EVEREST, Rev. R. on the Seasons, 281
———, on Lunar Influence, . 585
FALCONER, H. on Fossil Sivatherium,..... 38
——————— on Hippopotamus, .. 59
FOLEY, Capt. W. Geology of Moulmein, ... 269
—— on the Huns, ... 813
FORBES, Capt. J. on the Buddhas, 321
Fossil Genera in Dádúpur Collection,..... 291
—— Shells of Munoor, ... 108
——————— of Nirmul, ... 121
——- Wood of New South Wales, 127
——- Shells of Silhet, ... 519
——————— of Pulo Léda, ... 575
Fossil bones, Sivatherium, ... 38
——————— Hippopotamus, .. 59
——————— Chœrotherium, .. 127
——————— Mastodon, ... 294
——————— Rhinoceros,..... 486
——————— Felis, ... 579
——————— Gulo, ... 581
——————— Canis Vulpes,.... 582
——————— Genus Sus, ... 661
——————— Quadrumana,..... 739
——————— Mastodon, ... 768
——————— from the Cape of Good Hope, ... 518
——————————— Jumna,.... 589
——————————— Nerbada, 674, 828
Fossils presented to As. Society, 58, 179, 191, 373, 589, 674, 828
——- found at Perim, 288, 373, 438, ... 828
Freezing Point, raised in great altitudes, ... 187

	Page
Fribourg, Bridge at,	318
Gautama, the fourth Buddha,	328
Geological specimens from Shekáwatí,	59
Geology of Ava, specimens of,	437
——— of Malay Straits,	438
——— of Moulmein,	269
——— of the Straits,	575
——— of the Northern Concan,	761
——— of Hyderabad and Nagpur,	59, 96
Gold Mines of Jompole,	260
Grasses of Silhet Jhíls,	570
GRIFFITH, W. on Assam Botanical collection,	806
——— on Assam collection,	674
——— on Pollen	732
——— on Silhet Grasses,	570
HAMMER, PURGSTALL, Baron, translation of Mohit by,	437, 441
HANNAY, Capt., extract from Journal of,	126
HATHORNE, V., on Gaya inscriptions,	658
HELFER, Dr. J. H. on Assam Silk,	759
Hindu Colony in Armenia,	331
History, Chinese, extract on,	685
———, Sena Dynasty of Vakátaha,	727
——— of Rájas of Tagoung,	161
HODGSON, B. H. on Falconidæ,	227
——— Synopsis of Mammals,	231
——— on Nepál Ornithology,	358
——— on Wild Goat,	254
——— on Zoological Nomenclature,	751
——— description of Columba,	122
——— Sketch of Buddhism, 28,	71
——— on Ursitaxus,	671
——— on new Insessores,	770
——— on Charadriadæ,	775
——— on Falconidæ,	777
——— on Yunxinæ,	778
——— on Certhiadæ,	779
——— on Hirundinidæ,	779
Hotsprings of Cuddapah,	115
HUGEL, Baron, visit to Cashmir by,	184, 303
——— note on Perim Fossils by,	288
Huns, on a remnant of,	813
HUTCHINSON, Major, Report on roof of St. Peter's Church,	208
Hygrometry, experiments in,	396, 823
Ink, action of Copper on,	317
Iskardo, inscriptions found at,	56, 348
Inscriptions, Tibetan, from Iskardo,	57, 348
——— from Wara in Concan,	58, 340
Inscriptions at Bámián,	188
——— from Damatha Cave, Moulmein,	280
——— from Kemaon,	58, 347, 485
——— on Tib. Standard,	248, 264
——— on Bhitari Láth,	303, 349
———, ancient facsimiles of,	340
———, Burmese, from Moulmein,	341
——— from Chunar,	341, 731
——— from Barahát,	347
——— from Ajanta caves,	348, 556
——— from Pipliánagar,	377
——— on Tibetan Scarfs,	383
——— from Asírgarh,	482
——— on Peshawar image,	484
——— from Trincomali,	554
——— from Buddha Gaya,	657
——— in Society's Mus.	724, 731
——— from Seoni,	726
——— on Goa gun,	795
——— from Cuttack,	795
JACQUET, E. on Vallabhí Dynasty,	687
JACQUEMONT, V., Journal of,	190
Jelálábád, seat of Nysæan Kings,	20
———, description of ruins near,	393
JERVIS, Capt. T., Facsimile of inscription in Concan by,	58
Johóle, account of, in Malacca,	257
Kadphises, variations of the name,	553
Kakusanda, the first Buddha,	322
Kangtes of Assam,	197, 199
Karmika System,	78
Kashmir, see Cashmir.	
Kasyapa, the third Buddha,	327
Keisaney, a Hindu idol,	338
Kemaon, Tridents in,	485
Konagamma, the second Buddha,	325
Labong, Richardson's visit to,	618
Lambton's Tomb, Geology near,	120
Láth at Allahabad, motion respecting,	518
Library, Fort William, transferred to Asiatic Society,	125, 190
———, Oriental, transferred,	372
LUMQUA, Dr., books presented by,	246
LUSH, Dr. on Perim Fossils,	761
Mackenzie Papers, Report on,	512
MACNAGHTEN, W. H. on the Alif Leila manuscript,	590
Madras, Quarterly Journal of,	439
Maitri, the expected Buddha,	330
Malacca, States in the interior of,	61
———, Johole,	257
———, description of,	561
———, account of the,	505
———, Policy and Commerce of,	626

Page

MALCOLMSON, Dr. on Geology of Hyderabad, ... 59, 96
Manuscripts, Burmese, in Damatha Cave, ... 274
MASSON, C. on Bactrian Coins,.. 1
——— on Bámían inscriptions, 188
——— on Bactrian Coins, 436, 537
——— on Bámían antiquities, 707
Mastodon, narrow-toothed, ... 294
MASUD, brief account of, ... 635
McCLELLAND, Dr. discovery of Fossil Shells in Kasia hills by, 519
McCOSH, Dr. J. on Assam Mountain Tribes, ... 193
McLEOD, D. M. on Seoni inscription, ... 726
Medal, for paper on Physics, ... 371
MEKHARA MENG, letter from,.. 433
Meteorology, Horary observations, ... 51, 243, 298, 299, 300
Meteorological Tables for Calcutta, 60, 128, 192, 256, 320, 376, 440, 518, 600, 684, 760, 836
——— for Bangalore, ... 296
——— abstract of Bombay, .. 821
——— Socotra, ... 821
——— Tirhút, ... 822
——— Cawnpore, ... 823
——— Katmandu, ... 824
——— Simla, ... 825
——— Kandy in Ceylon, ... 826
——— Gohati in Assam, .. . 827
MILL, Rev. W. H. on Chunar inscription, ... 342
——— on the Alif Leila, 597
Miris of Assam, ... 194
Models of Nepálese arts, ... 126
Mohit, extracts from, translated, 441
MOHUN LAL, on Farid Shakarganj, 635
——— on Uch-Sharíf, ... 796
Moon, influence of, on rain,..... 285
——-, influence of, on Barometer, 585
MONTRIOU, Lieut. specimens presented by, ... 59
MOORCROFT, Mr., Papers of the late,..... 54, 189
MOUAT, Dr. A., Meteorological observations by, ... 296, 298
Moulmein, Geology of, ... 269
Muamarias or Mattuks of Assam, 206
Muar, a Malacca State, ... 561
Museum, discussion regarding,.... 245
———, Report on,..... 249
Nagarjuna, period of, ... 522
Nagas of Assam, ... 207
Nanaia, temple of, in Armenia,.. 267
Natural History, Columba, sp. nov. 122
———, Falconidæ, Nov. Sp... 227
———, Synopsis of, Nepálese Mammals,.... 231

Page

Natural History Cervus Duvaucelii, 240
——— Canis Vulpes Montana, 313
(See ornithology, Shells, &c.)
———, presentations of objects in,..59, 191, 304, 374, 438
———, wild goat of Nepál, .. 254
NEWBOLD, Lt. on Malacca States, 61, 257, 505, 561, ... 626
NIERSES CLAJENSIS, Memoir of, 130
Nepál, report on products of, .. 365
Nomenclature, on Zoological, .. 751
Opium, preparation of, ... 165
Oriental Publications, French support of, ... 754
Ornithology, new Meruline Birds, 358
———, new Meropidæ, ... 360
———, new Strigidæ, ... 363
Parliamentary Records presented, 673
Parsis, notice respecting the,.... 396
Pasewa, fluid of Opium,..... 168
PEARSON, J. T. on Canus Vulpes, 313
Perim, Fossils bones from,..... 766
Peshâwar, image found near,.... 484
Peshâwar, geography of, 468, 475
Pérak, a Malacca State, ... 505
Philosophy, Bauddha system of, 29
PIDDINGTON, H. on Basilosaurus, 254
——— on Cotton Soil,.. 314
Piracy, mode of putting down, .. 634
Pollen, development of,.. 732
Political Relations with Malacca, 626
Population of Mathusa, ... 216
PRINSEP, JAS. on new Standard Barometer, ... 244
——— on Fort Church roof,.. 208
——— on Damatha cave inscription, ... 280
——— action of Copper on Ink, 317
——— on Ancient Inscriptions, 340, 482, 554, 657, 724, 795
——— on Wet-bulb Thermometer depressions,..... 396, 828
——— on measurement of Arabic Quadrant,..... 448
——— on new Bactrian Coins,.....548, 720
——— on Statue of Silenus, .. 568
——— on new Mithraic Coins, 639
——— on Hindu Coins,..... 644
——— on Vallabhí dynasty,.. 685
——— on Arabic instruments, 784
——— on Sámar Salt, ... 798
——— on Barometric range in various places, ... 816
[And all editorial matter.]
Proceedings of the Asiatic Society, see As. Soc.
Pulo Tingie, Geology of,..... 575
Rain, on periodical return of, ... 281
RALPH, G. on Ajanta Caves, 348, 557

	Page
Remusat, A. doctrine of Triad, 32,	37
Report on the Alif Leila,.....	589
——— on Euphrates Expedition,	675
——— on Mackenzie Records, ..	512
——— on the Mahawanso, ...	829
——— of Society of Arts on Wool, &c.	365
Rice, Nepál, quality of, ...	366
Richardson D. journey to the Kayens and Shans,..... 605,	688
Roof of St. Peter's Church, ...	208
Rumbówe, account of,.....	61
Sakya Sinha, lineage of, ...	31
Salt of Sambhur lake, ...	798
Sanscrit attributes of Adi Buddha,	91
Sárnáth, Statues discovered at, ..	588
Satlaj River, soundings in the, ..	814
Seal of Johóle Panghula,.....	263
Seasons, revolution of the, ...	281
Silenus, Indian statue of,.. 517,	567
Silhet, Fossil Shells of,.....	519
——— recent shells described, ..	741
Silk of Assam, note on, ...	759
Singphos of Assam, ...	199
Sivatherium, a new Fossil ruminant, ...	38
Shells, Land and Fresh-water, of Silhet, ... 350,	741
——— new genus of Mollusca, ..	781
——— Pterocyclos,.....	782
Sreminánti, a Malacca State, ...	507
Soil, suitable for cotton, &c., ..	314
Stacy, Col. L. R. on Grecian Sculpture,.....	567
Statistics of Mathura or Muttra,	216
Stephenson on Sambhur salt, ..	798
Sugar, soil suited to, ...	316
Snakes, notice of new,.....	439
Swábhávika Doctrine,.....	71
Table of Annual Rain-fall,.....	286
Table of Dádúpur Fossils, ...	293
——- of Wet-bulb Thermometer,	430
Tagoung, images discovered at,..	126
Taylor's, Major, report on the Boring in Fort William, ...	374
Taxila, on province of, ...	468
Tenasserim, journey into, .. 601,	688
Tea, soil suited to, ...	314
Tibetan Standard, inscription on,	248
——— Sacred Scarf, ... 373,	384
———, Soil suited to, ...	315
Trade of Assam with China, ...	203
Traill, Mr., Facsimiles of inscriptions by, ...	58
Tribes, Hindu, notice respecting,	308
Turnour, Honorable G. on Buddhist Chronology,.....	521
———, on Mahawanso,.. 570,	829
Uch-Sharíf, notice of, ...	796
Upham's work on Buddhism,....	35
Ursistaxus, note regarding,.....	671
Vallabhí Dynasty, Chinese note on, ...	687
Vigne, Mr. Travels in Cashmir,..	56
Wade, C. M. soundings of Satlaj,	814
Water, fresh, found at Sea,.....	219
Weaving practised in Nepál, ...	219
Weights of Malacca, ...	268
Wet-bulb Thermometer, Researches on the, ... 396,	828
Wilkinson, L. translation of inscription by,.....	377
Wilson, (Rev. John), address to Bombay Society by,.....	304
Wool, Nepálese quality of,.....	368
Wroughton, W. R. table of the Statistics of Muttra, by	216
Yatnika system, ...	81
Yusafzais, tribes of the,.....	481

USEFUL TABLES

OF INDIAN

METROLOGY AND CHRONOLOGY.

COMPILED BY

JAMES PRINSEP,

F. R. S. Sec. As. S., &c.

1835.

USEFUL TABLES,

FORMING

AN APPENDIX

TO THE

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PART THE SECOND.

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OF

Ancient and Modern India;

INCLUDING A CHRONOLOGICAL TABLE OF THE PRINCIPAL EVENTS OF BRITISH CONNECTION WITH INDIA.

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CONTENTS AND TABLES OF PART II.

	Page
Eras of ancient and modern times,	1
The Roman year,	2
The Julian reformation of the calendar,	4
The Olympiads of Greece,	4
The Christian era—old and new style,	5
Eras of Constantinople, Alexandria, Abyssinia,	7
The Jewish era,	8
Era of Nabonassar—Egyptian,	9
Julian Period—era of martyrs—of Alexander,	10
Eras of Seleucus—Tyre—Antioch—of Abraham, of the Cæsars—(Spanish,)	11
French Revolutionary Calendar,	12
Era of the Armenians,	13
The Hejira, or flight of Mahammed,	13
Chinese and Japanese Cycle,	14
Indian Chronology—Solar or Siderial Year,	17
TABLE I.—Seasons, signs, months, and lunar mansions,	18
II.—Divisions of the day,	19
III.—Hindu Planetary System,	21
1.—Eras dependent on the Solar Year,	22
2.—Luni-solar year,	22
Era of Vikramáditya,	25
Balabhi and Siva Singha eras,	26
3.—Cycles, Era of Parasuráma, of Vrihaspati, &c.	27
Tibetan Calendar,	29
TABLE IV.—Vrihaspati Chakra, (or Cycle of Jupiter,)	31
Eras of Buddha in various countries,	32
Jain era of Mahavira,	33
Burmese and Nipalese eras,	34
4.—Eras derived from the Hejira;—Fasli,	34
Táríkh Iláhí of Akber,	37
Shahúr or Súr era of Maharashtra,	38
Jalús Suns—Rájabhishèk,	39
Tabular View of Eras used in India,	40
Directions for using the Chronological Tables,	41
TABLE V.—Subdivision of Mohammedan year,	43
VI.—*Ahargana Chandramana*, or luni-solar periods,	50
VII.—Subdivision of Hindu luni-solar year,	51
VIII.—Solar Ahargana or lapsed periods,	52
IX.—Epochs of Hindu Solar years, in European dates,	52
X.—Subdivision of Hindu Siderial year,	53

		Page
TABLE	XI.—To find the Christian day of the week,	54
	XII.—Scales of Christian Solar year,	55
	XIII.—General table of the Hejira, an. 1. to an. 1318,	57
	XIV.—Part I. Hindu Siderial years from A. D. 1600 to A. D. 1900,	65
	Part II.—Luni-solar years ditto,	71
Genealogical Tables, Correction of epochs,		78-79
Utility of coins and inscriptions,		81
Erroneous equation of Samvat era,		81*
TABLE	XV.—Hindu Theogony,	85
	XVI.—Pauranic Genealogies ;— of *Swayambhuva*,	93
	XVII.—The Surya-vansa or Solar dynasty,	94
	XVIII.—The Chandra-vansa or Lunar races,	96
	XIX.—Pandu dynasty of Indraprestha,	98
	XX.—Lunar Kings of Magadha,	99
	XXI.—Andhra dynasty of Telingana,	100
	XXII.—Rájas of Cashmir,	101
	XXIII.—Chohans of Delhi and Ajmír,	104
	XXIV.—Harauti branch of ditto, Kota and Bundí,	105
	XXV.—Rájas of Malwa,	106
	XXVI.—Balabhi dynasty of Saurásh̀tra,*	107
	XXVII.—Anhulwaras of Gujerát,	108
	XXVIII.—Ránas of Mèwár,	109
	XXIX.—Rahtores of Kanouj,	110
	XXX.—Ditto of Márwár or Jodhpur,	111
	XXXI.—Ditto of Bikanèr,	111
	XXXII.—Ránas of Amber or Jaipur,	111
	XXXIII.—Raos of Jesalmér,	112
	XXXIV.—Rájas of Orissa,	113
	XXXV.—Ditto of Nèpál,	114
	XXXVI.—Ditto of Simroun,	116
	XXXVII.—Ditto of Bengal,	117
	XXXVIII.—Ditto of Assam and Kamrup,	117
	XXXIX.—Ditto of Manipur,	119
	XL.—Sholan dynasty of Karnata,	119
	XLI.—Belal Rájas of Ditto,	120
	XLII.—Adeva Rájas of Tuluva or Warancal,	120
	XLIII.—Rájas of Chola, (Coromandel,)	121
	XLIV.—Ditto of Chera, (Coimbetore,)	121
	XLV.—Pandyan dynasty of Madura,	121
	XLVI.—Rájas of Vijayanagar,	122
	XLVII.—Ditto of Maisur,	123
	XLVIII.—Paligar dynasty of Trichanápalí,	123
	XLIX.—Valugati Rájas of Venkatagirí,	124
	L.—Indian Princes mentioned in Ferishta's History,	124
	LI.—Marhatta Governments, 1 Sattara, 2 Peshwas, 3 Nagpur, 4 Sindia, 5 Holkar, 6 Gykwar,	126
	LII.—Sikh Government of Lahore,	127
	LIII.—Chinese, Japanese, and Buddhist Chronology,	128
	LIV.—Buddhist Chronology of Tibet,	129

* In the text Surat is put as the modern synonyme of Saurashtra ; this is a mistake. *Surastrene* of ancient geography is the equivalent term.

Page

TABLE LV.—Kings of Tibet, ... 131
LVI.—Burmese dynasties, ... 132
LVII.—Chiefs of Labong and Zimmay, ... 135
LVIII.—Sovereigns of Ceylon, ... 135
LIX.—Greek dynasties of Asia, ... 140
LX.—Mythological History of Persia, ... 141
LXI.—Sassanian dynasty of Persia, ... 141
LXII.—Khalifs of Baghdád, ... 142
LXIII.—Samanian dynasty of Western Persia, ... 143
LXIV.—Ghaznevides of Persia and India, ... 143
LXV.—Seljàks of Persia, Kirman and Rum, ... 143
LXVI.—Atabegs of Irak, ... 144
LXVII.—Turcoman Ortokites, ... 145
LXVIII.—Moghel Empire of Tartary, ... 145
LXIX.—Ditto or Il Khanian Dynasty of Persia, ... 146
LXX.—Ditto of Khorasan, ... 146
LXXI.—Sufí dynasty of Persia, ... 146
LXXII.—Patan or Ghorí Sultáns of Delhi, ... 147
LXXIII.—Ditto ditto of Bengal, ... 147
LXXIV.—Sharkí Dynasty of Jaunpur, ... 148
LXXV.—Musalman Kings of Kashmir, ... 149
LXXVI.—Kings of Sind and Tatta, ... 149
LXXVII.—Jámí dynasty of Samána, ... 149
LXXVIII.—Bahmany dynasty of Kalbarga, ... 149
LXXIX.—Berid Shahy dynasty of Beder, ... 150
LXXX.—Faruki Dynasty of Kandeish, ... 150
LXXXI.—Kings of Malwa, ... 150
LXXXII.—Kings of Gujerát, ... 150
LXXXIII.—Ditto of Multán, ... 151
LXXXIV.—Imad Sháhy dynasty of Berar, ... 151
LXXXV.—Adil Sháhy dynasty of Bijápur, ... 151
LXXXVI.—Nizam Sháhy ditto of Ahmednagar, ... 151
LXXXVII.—Kutb Sháhy ditto of Golconda, ... 152
LXXXVIII.—Moghel Emperors of India, ... 152
LXXXIX.—Nizáms of Hyderabad, ... 152
XC.—Nuwabs and Kings of Oude, ... 152
XCI.—Chronological Table of European and British Connection with India, ... 153
XCII.—Present Political Divisions of India, ... 187

GENEALOGICAL TABLES.



The purpose of the present division of our Appendix is by no means to attempt any improvement, nor even a critical adjustment, of the catalogues of princes preserved in the legendary records of the brahmans, but merely to afford a succinct synopsis of the principal ancient and modern dynasties of India, and of the neighbouring countries, for reference as to names, and, where accessible, as to dates.

For the early or mythological history of the Hindús, little can be done beyond enumerating the mere names, and marking the few variations in the lists of Sir Wm. Jones, Wilford, Bentley, Hamilton, Wilson, and latterly, Col. Tod, who have endeavoured, successively, to trace the parallelism of the solar and lunar races, and assign to them more probable dates than those extravagantly put forth in the *Puránas*. As the regular succession from father to son is given in them it was not a difficult task to apply the ordinary term of human generation, derived from the authentic histories of other countries, to the adjustment of the Hindu Chronology. Thus Ráma in the solar line, who is placed by the brahmans between the silver and brazen ages, (867102 B. C.,) was brought down by Sir Wm. Jones to B. C. 2029, and reconciled with the Rama of Scripture : Pradyota, of the lunar race, in whose reign the last Buddha appeared, was brought down to B. C. 1029, the assumed epoch of Sakya in Tibet and China : and Nanda to 699, &c. In the case of the *Magadha* Rájas this adjustment was the more easy, because the length of each dynasty is given in reasonable terms from Jarasandha, the contemporary of Yudhisthira, downwards; and the error might be only in the wrong assumption of the initial date, the epoch of the *Kalí Yuga*, which the pandits allotted to the year 3101 B. C. After the discovery of the identity of Chandragupta with Sandracottus, pointed out by Sir Wm. Jones, (As. Res. iv. 26,) and followed up by Wilford, (v. 262,) a further reduction of 250 years in the position assigned to him in Sir William's first list became necessary ; and the diminished rate of generations, applied backwards, brought Yudhisthira, and his con-

temporaries ARJUN, KRISHNA, and JARASANDHA, within the twelfth or thirteenth century before Christ. A most satisfactory confirmation of the modified epochs of NANDA, CHANDRAGUPTA, and ASOKA has been since derived from the chronological tables of the Buddhists in Ava, published in CRAWFURD's Embassy, and again in those of the Ceylon princes, made known by the Honorable G. TURNOUR: their near concurrence with Greek history, in the only available point of comparison, reflects back equal confidence upon the epoch assigned to the founder of their religion, (B. C. 544,) in spite of the Chinese and Tibetan authorities, most (though not all) of which place BUDDHA 500 years earlier. It was this that misled Sir WM. JONES in the epoch of PRADYOTA.

There are some discrepancies in the Burmese tables difficult to be explained, such as the placing of AJATASATRU 80 years prior to SISUNÁGA, and the occurrence of CHANDRAGUPTA still 50 years too soon: but we must refer those who would investigate this, and all other branches of the intricate subject of Hindu and Bauddha chronology, to the learned authors we have above mentioned, satisfying ourselves here with exhibiting a comparative table of the gradual changes effected by the progress of research in a few of the principal epochs.

Names.	*Pauranic date.*	*Jones.*	*Wilford.*	*Bentley.*	*Wilson.*	*Tod.*	*Burmese list.*
	B. C.	B. C.	B. C.	B. C.	B. C.	B. C.	B. C.
IKSWAKU and BUDDHA,	2183102	5000	2700	1528	—	2200	—
RAMA,	867102	2029	1360	950	—	1100	—
YUDHISTHIRA,	3102			576	1430		
SUMITRA and PRADYOTA,	2100	1029	700	119	915	—	600
SISUNAGA,	1962	870	600	—	777	600	472
NANDA,	1600	699	—	—	415	—	404
CHANDRAGUPTA,	1502	600	350	—	315	320	392
ASOKA,	1470	640	—	—	250	—	330
BALIN,	908	149	—	—	21	10	—
CHANDRABIJA, the last of *Magadha* Rájás,	B.C. 452	300 A. D.	—	—	428 A. D.	546 A. D.	

The aid of astronomy has been successfully called in to fix such epochs as afforded the requisite data; thus the situation of the equinoctial colure in the time of the astronomer PARÁSARA, who flourished under YUDHISTHIRA, is fixed by DAVIS in 1391 B. C.; by Sir WM. JONES, COLEBROOKE, and BENTLEY, in 1180; which latter closely accords with the epoch of the *Cycle of Parasuráma*, used in the Dakhan, and apparently unknown to these authors, B. C. 1176. BENTLEY, on another occasion, alters this date to 575 B. C.! he also places RÁMA in 950 B. C.; but there is great uncertainty and incongruity in many of his determinations of the dates of native princes and of books, from the prejudices he exhibits, although he is entitled to every con-

fidence in his ingenious mode of calculating the period at which the various improvements in astronomy were introduced, and the *Siddhántas* written or revised, by the time when the positions of the planets, as assigned by their tables, accorded best with the more accurate results of European astronomy. From the minimum errors, and the precession of the equinoxes, (first applied to such a purpose by Sir Isaac Newton,) we have the following epochs substantially ascertained:

Invention of the *Nacshatras* or Hindu Lunar mansions,.....	B. C.	1425 B.
The *Mahábhárat* war, according to Wilford, ...		1367
The Solar Zodiac formed by Parasara, (under Yudhisthira,) ...		1180
Era of Parasura'ma commences (see page 26) 7 August		1176
A Lunar Cycle invented, and precession discovered (Ráma?).....		945 B.
Four Yugas, founded on Jupiter's motions, ...		215 ?B.
Seven Manwantaras, founded on Saturn's revolutions,.....	A. D.	31 ?B.
The *Rámáyana*, written by Valmi'ki, ...		291 ?B.
Vara'ha Mihira, flourished, according to Telugu astronomers, (also Sir W. Jones, Colebrooke, &c. from precession of the equinoxes,)..		499
Tables of the *Brahma Siddhánta*, fixation of the sideral Zodiac, and new system of Chronology, with extravagant antiquity, compiled,.....		538 B.
The *Mahábhárat* written, from Krishná's *janampatra*, ...		600 ?B.
The Javanese translation of ditto, according to Raffles, in		1079
Vishnu Purána, whence genealogies of Andhra kings, 4955 K. Y. or		954 W.
Origin of the *Kala Chakra*, or Jovian Cycle, (See prec. sect. p. 29,)		965
Tables of the *Surya Siddhánta*, by Vara'ha Mihira,.....		1068-91 B.
The *Varahí Sanhita*, supposed by the same author, gives its own date,		1049
The *Lilávati* of Bha'skar Acha'rya, bears its own date, ...		1088
The *Bhásvatis* of Satananda, pupil of Vara'ha, Saca 1021, ...		1109
The *Bhágavat*, supposed by Colebrooke to be written by a grammarian in.....		1200
The *A'rya Siddhánta*, compiled by A'rya Bhatta, ...		1322
Gangadhar's Comment on Bha'skar A'cha'rya,.....		1420
The Works of Kesava,.....		1440
The *Graha Lághava*, by Gonesh, his son,.....		1520

Mr. Bentley would rob the seven last of a few centuries upon very insufficient grounds; he also ventures to place the authorship of the Rámáyana in A. D. 291, and that of the Mahábhárata in A. D. 600, on far too slender astronomical data: but his mania for modernizing renders his testimony of the advanced knowledge of the Hindus in astronomy, at so remote a period as the fifteenth century before Christ, the more valuable; and we can have little hesitation in giving credit to the lines of princes assigned to this space, and even to further antiquity, although their history has been mixed up with incredible mythos, and a falsified chronology. The more moderate and rational dates preserved by the Bauddha priests would lead to a

supposition that the brahmans had purposely antiquated theirs, to confound their rivals in the contest for ascendancy over the minds of princes and people. That they should have suspended their histories with SUMITRA of the solar, and CHANDRABIJA of the lunar line, in the fifth century, might be naturally accounted for by the predominance of the Buddhists at that period, or more probably by the destruction of the Hindu monarchies by the incursions of the Huns and Tartars. The *Puránas*, or at least the prophetical supplements describing their genealogies, must have been compiled long afterwards, and the relative dates then falsified. But the principal blame in the business seems to fall upon the astronomers, who are accused of throwing back the commencement of their era : for, taking the data of the *Pauránic* tables, and allowing, with them, 1015 years from YUDHISTHIRA to NANDA ; and from the latter prince to PULIMAN 836 years, (which name is identified with POULOMIEN of the Chinese by WILFORD, and placed in the year A. D. 648,) the highest estimate of the *Bhágavat* gives 1857 B. C. for the epoch of the *Kali yuga*, instead of the 3101 assigned in the astronomical works ; while in the *Brahmánda Purána*, it is brought down to B. C. 1775 ; and in the *Váyu Purána*, to B. C. 1729. The Jains, it is said, adopt the still more modern epoch of 1078 B. C. ; and if ANJANA of CRAWFURD's Burmese chronology, founder of the sacred epoch, be ARJUNA, this contemporary of YUDHISTHIRA is placed by the Bauddhas so late as 691 B. C. !

The Jains are generally also the most trust-worthy authorities for the middle ages. To them it is asserted, that ABUL FAZL is indebted for the series of Bengal, Malwa, and other princes published in the *Ayín Akbery* with every appearance of accurate detail. The *Rája Taringini* of Cashmír also, the only Indian history of any antiquity, begins with Buddhist theogony. The *Rájávali* collection of genealogies is quite modern, having been compiled by SIWAI JAYA SINH of Ambír, in 1650. Neither that nor the native bards and chroniclers, whence the valuable data for the more modern history of Hindustan were furnished to Col. TOD for his Annals of Rájasthán, are to be trusted when they trace the ancestry of their princes back, and strive to connect them with the latter heroes of the *Puránas ;* nor even to the earlier centuries of the Christian era, in which we find hardly any of their names confirmed either by grants, coins, or by the historians of neighbouring countries.

More authentic in every respect are the copper-plate grants, dug up in many parts of India ; and the Sanscrit inscriptions on columns and temples ; of which many have been decyphered and published, although the subject is by no means yet exhausted. Owing to a

fortunate pride of ancestry, most of these records of kingly grants recite a long train of antecedent Rájas, which serve to confirm or to supply vacuities in the more scanty written records. Of the value of these to history we cannot adduce a better instance, than the confirmation of the *Bhupála* dynasty of the Rájas of *Gaur*, as given by Abul Fazl in the occurrence of the names of Devapála, Dhermapála, Rájapála, &c., on the several monuments at *Monghir*, *Buddal*, *Dinájpur*, *Amgáchi*, and *Sárnáth* near *Benares*, where also the date and the Buddha religion of the prince are manifested. It was supposed by Mr. (now Sir Charles) Wilkins, that the two first inscriptions referred to the first century of the *Samvat* era ; but, as shewn by Mr. Colebrooke, as well as by actual date at *Sárnáth*, they rise no earlier than the tenth. Indeed, the occurrence of inscriptions *bearing unequivocal dates*, anterior to that period, is very rare. Col. Tod adduces one of the fifth century (S. 597) discovered near *Kota*. Mr. Wathen has also recently produced two of the 4th and 6th centuries, dug up in Gujerat, which confirm, or rather correct, the early records of the *Saurashtra* dynasty. The oldest, however, exist in Ceylon, where they have been brought to light by Captain Forbes and the Honorable Mr. Turnour : some of these, of which translations are published by the latter author in the Ceylon Almanac for 1834, are ascribed, on evidence of facts mentioned in them, to the year A. D. 262 ; but they bear no actual date. The period most prolific of inscriptions is from the 9th to the 13th century ; when an anxiety seems to have prevailed among the priests to possess graven records of grants from the reigning or from former sovereigns, in order probably to secure their temples and estates from spoliation or resumption in those turbulent times. One of Col. Tod's inscriptions, translated by Mr. Colebrooke, in the Roy. As. Soc. Trans. vol. i. expressly declares a rival grant to be futile, and derived from an unauthorized source.

The value of inscriptions, as elucidations of history, cannot better be exemplified than by the circumstance of the Burmese inscription in the *Páli* character found at *Gayá*, on the visit of the envoys from Ava, in 1827, of which a translation was printed in the Journal As. Soc. iii. 214. It records the frequent destructions and attempts to repair the Buddhist temple there, and the successful completion of it in the Sacaráj year 667, A. D. 1306*. Now Col. Tod's Rajput annals of Méwár make particular mention of expeditions to recover *Gaya* from the infidels, in 1200-50, which might not but for this record have been capable of explanation.

* Col. Burney reads the date, which is rather indistinct, 467, or A. D. 1106 ; but the above evidence tends to confirm the original reading.

Where dates are not given in inscriptions, the style of the Nágari character will frequently serve to determine their antiquity. The cave temples of the west of India exhibit the most ancient form; the Gujerát type, above alluded to, of the 4th century, has a part connection with them, and part with an inscription at Gya, and another on the Allahábad *láth*:—these again are linked by intervening gradations to the Tibetan alphabet, of which we know from Tibetan authors the existing Nágari of *Magadha* was taken as the basis in the seventh century. We shall soon be able to furnish a tolerably accurate palæographical series of the Devanágarí, but can here only allude to the subject.—In the tenth and eleventh centuries, it undergoes the modification observable on the *Gaur*, *Sárnáth*, and *Shekáwati* inscriptions, resembling very nearly the Bengálí type, of which it is doubtless the parent. The modern Nágari is found on monuments of the 13th century, when the irruption of the Moghuls prevented any further change. There is also a still earlier character on the Delhí, Allahábád, and Tirhut *láths*, which remains yet undecyphered; strong reasons have been advanced for its alliance to the Sanscrit group, if it contain not indeed the original symbols of that language. (See Journal As. Soc. vols. iii. iv.)

In all other countries, coins and medals have been esteemed the most legitimate archives and proofs of their ancient history. In India, little recourse to such evidence has hitherto been available. The few Hindu coins discovered have been neglected or deemed illegible. The subject is however now attracting more attention, from the recent discovery of Bactrian and Indo-Scythic coins in great abundance in the *Panjáb*, bearing names hitherto quite unknown, in Greek, and on the reverse side in a form of Pehlevi character. The series is continued down to, and passes insensibly into, the purely Hindu coins of *Kanouj*, and some are in our possession, with Greek and Sanscrit on the same field. This very circumstance tends to bear out Colonel Tod's supposition of the Kanouj princes having an Indo-Scythic origin. Yavan-asva, their progenitor, may indeed be "the Greek Azo," of whose coins we have so plentiful a supply*. The Sanscrit characters on the *Kanouj* coins are of the earlier type belonging to the fourth or fifth century:—they will soon, it is hoped, be read, and put us in possession of several new names.

Other coins, in a still more ancient character, and nearly resembling the undecyphered letters of the *láths* or the cave-sculptures†, are dug up in the Delhí district:—they are found in company with Buddhist relics, and will hereafter, doubtless, lead to historical information.

A third series of coins, with devices of a brahmani bull, and a horse-

* See Journal As. Soc. June 1835. † See Journal As. Soc. vol. iii. p. 495.

man, bears the *Gaur Nágari* of the 10th century ; on this several names have been made out, Bhi'madeva, &c.; and on some, the Persian titles of the first Musalman conquerors are impressed.

A fourth series, with a sitting female figure, is in the modern Nágari, and is probably the latest of the Kanouj coins. The early Muhammedan coins of Sabaktegin, Mahmud, &c. frequently have a partial admixture of Nágari, which will aid in locating the rest ; for while this provoking dearth exists with regard to Hindu coins, we find coins with legible names and Hejri dates for the whole line of their Muhammedan conquerors, whose history is amply preserved without their aid.

One confirmation of a historical fact from numismatic aid has been remarked in the discovery of the name of *Vásu Deva* or *Bas-Deo*, on a Sassanian coin. Ferishta states, that Bas-deo, of Kanouj, gave his daughter in marriage to Bahram of Persia, A. D. 330 :—the coin marks exactly such an alliance ; but the Hindu chronicles admit no such name until, much later, one occurs in the Malwa catalogue of Abul Fazl.

In the dynasties of Nepal and Assam, (at least from the middle of the seventeenth century,) we have been wholly guided by coins in our possession ; and it might be possible, by persevering search, to obtain from the same source the names of many Rájas antecedent to this period, which are now doubtful or wholly unknown.

From the time of the subversion of the Moghul empire in the middle of the last century, the historical train of their coins ceases to be available ; all the native states having, in imitation of the English, struck their money in the name of a nominal sovereign of Delhi, with no regard to dates, or even to the existence of the monarch ; and up to the present time, we have had the names of Muhammed Shah, Alemgir II., and Shah Alem, issuing simultaneously from the native and the Company's Mint, while a second Akber sways the pageant sceptre of the seven climes ! (See first part of Appendix.)

It must be confessed that a large field still remains open, for the re-investigation of the middle ages of Hindu history, in judicious hands ; for independently of the new materials now before us in the numerous coins lately discovered, and in many new inscriptions, we have the aid of the foreign histories of Ceylon, Ava, Tibet and China ; we have access to the native volumes before only consulted through interested pandits ; and we have Col. Tod's ample traditions and real archives of the principal portion of the Indian continent, the seat of all its important history. To say nothing of the minute and circumstantial numismatic histories of Greece and Rome, it is principally to coins that we owe the history of the Arsacidæ of Persia,

through VAILLANT's investigation. The Sassanidan dynasty has also been illustrated from similar materials by FRŒHN and DE SACY. MARSDEN has extended the same principle to the Muhammedan princes of Persia and India, and to some few Hindu states, in his *Numismata Orientalia ;* and its application may be still further urged in the latter line with the greater success, in proportion to the greater dearth of other materials for history, as is exemplified in the coins of the Bactrian provinces. The first thing to be done will be to expunge and lose sight of the learned but entangled accounts of Col. WILFORD and others, which, while they have confused, have frightened critics at the perplexity of the subject. The *three* VIKRAMÁDITYAS, and *three* Rájá BHOJAS, invented to reconcile discrepancies in dates, will perhaps be found as little needed as the multiplication of BUDDHAS, the two principal of which are now seen by the identity of their biography to be the same personage.

Of the confirmation of the testimony of inscriptions by that of coins, we have remarkable instance in the CHANDRAGUPTA and SAMUDRAGUPTA of *Kanouj*, names first discovered on the Allahabad pillar, and now fully made out, along with several others of the same dynasty, on the gold coins found in the ruins of that ancient town. In no other record have we any mention of these sovereigns*, who must have been several centuries anterior to CHANDRA DEVA, the founder of the last reigning dynasty, which was overthrown by the Muhammedans.

The native dates of events, as has been already stated, are most vague and uncertain : still there are instances in which they have undergone further perplexity from their European commentators.

The looseness with which the chronology of the Paurânic genealogies has been investigated, is pointed out in Mr. WILSON's remarks on the *Vishnu Purâna*, the authority whence Sir WM. JONES' list was furnished by his Pandit (Journal As. Soc. i. 437.) By some mistake he gave 345 years to the *Kanwa* dynasty of four Rájás, and in this he was blindly followed by WILFORD and BENTLEY, both professing to consult the original. Now all the manuscripts examined by Mr. WILSON give only 45 years! Indeed, when the epoch of CHANDRAGUPTA is adjusted, the periods given in this *Purâna* from PARIKSHIT (B. C. 1400) down to the termination of the list in A. D. 436, are quite rational.

A more glaring instance of error, sanctioned, nay almost perpetuated, by the extent to which it has been spread, has originated in blindly following the authority of the pioneers of our Sanscrit researches ; and it is strange that it has never been detected, that we are aware of, up to the present day ! We allude to the mode of converting the *Sam-*

* See Journal As. Soc. vol. iii. 141-4.

vat of VIKRAMÁDITYA into the Christian era by subtracting 56 instead of 57, thereby inducing a constant error of one year in all dates of chronicles, deeds, and inscriptions so read. We have taken some trouble to trace the origin of this mistake, from curiosity, and it shews how subject we are to rest upon the assertions of others without duly scrutinizing the data on which they may be grounded.

VIKRAMÁDITYA died in the *Kali yuga* year 3044, according to WILFORD, whose essays in the 9th and 10th vols. of the Asiatic Researches contain the fullest information on the history of the *three* supposed princes of this name, and of their common rival SÁLIVÁHANA. The 1st *Samvat*, therefore, concurs with the year 3045 K. Y.; and to convert the latter into the former, 3044 must be uniformly deducted. This calculation agrees with WARREN's *Kála Sankalita*, (see prec. Sec., p. 25, and tab. 71,) also with ABUL FAZL's statement, that "in the fortieth year of AKBER's reign (A. H. 1003, commencing 5th Dec. 1594, and ending 25th Nov. 1595, A. D.) there had elapsed 4696 years of the era of YUDHISTHIRA *(Kali yuga)*," making its commencement, 3101 B. C.

Also 1652 years of the era of VIKRAMÁDITYA (1652-1595=57 B. C.)

and 1517 years of the era of SÁLIVÁHANA, (1595-1517=78 A. D.)

The Bengálí Almanacs, published at *Nadiyá*, give precisely the same agreement*. The Almanac of the *Sadar Dewání*, and the statements at the head of all the regulations of Government, coincide therewith: thus, the *Samvat* year 1877 began on the 15th March, 1820 = 57 years difference. If further evidence is required of the knowledge of the true era in possession of English authors, we have in BUCHANAN's Mysore, vol. iii. 112:—"3786 years of the *Kali yuga* had now elapsed, of which the particulars are, 3044 years of YUDHISTHIRA.

135 years of VIKRAMA.

607 years of SÁLIVÁHANA.

3786 K. Y., or A. D. 685."

Here the interval between 3044, whence the *Samvat* commenced, to the *Saca*, is 135, or 57+78 years; (or 135 — 685—607=57).

Again, Dr. HUNTER, in his account of the Astronomical labours of Rája JAI SINH, dates them in "1750 *Samvat*, or 1693 A. D.," making the interval 57 years.

Sir WM. JONES, residing in Calcutta, where the *Samvat* is not used,

* One Bengálí Almanac, however, printed in Calcutta, which was brought to us for comparison, had both the *Samvat* and the *Saca* era one year in defect! the *Bengálí san* being the only era now used in Bengal, little care is taken in regard to the rest. The *Kali yuga*, the foundation of all, was however correct.

in his speculations on Hindu chronology only alluded to the *Kali yuga*. Davis, in his account of the native method of eclipse calculations, used the *Saca* only; but he frequently alluded to the *Kali yuga*, the first year of which he correctly placed in 3101 B. C.

Whence then can the now common, nay almost universal, application of the subtrahend 56 have proceeded? Simply from Wilford's having placed the *Kali yuga* epoch in 3100, instead of 3101 B. C., in his essay expressly written to settle the eras of Vikramáditya and Sáliváhana, to which too much confidence has been given by subsequent writers. Having every where assumed this erroneous datum, it followed, that the *Samvat* epoch, which he rightly placed 3044 after Yudhisthira, would concur with 3100—3044=56 B. C.* But whence did he get his erroneous epoch of the *Kali yuga?* This also we may conjecture, having already seen him convicted, on another count, of blindly adopting Sir W. Jones' data. Sir William, in his Essay on Hindu Chronology, (As. Res. ii. 126,) says, "4888 years of the *Kali yuga* are passed up to the present time;" and his table of comparative epochs is calculated from 1788 A. D. leaving an obvious difference of 4888—1788 = 3100 B. C. which Wilford seems to have adopted. Had he however looked to the heading of the article, he would have found the date "*January*, 1788," consequently the K. Y. year commencing in April, 1787, had not yet expired: the true difference therefore was 4888—1787=3101, or more exactly $3100\frac{3}{4}$ years; or for the *Samvat*, $-56\frac{3}{4}$, in nearest round terms 57†. (See page 25.)

Wilford is not the only author who was thus led to adopt the wrong equation. Colebrooke and Wilson always use 56. Jervis's Chronological Tables have the same interval; and Colonel Tod employs it throughout his voluminous chronicles of the Rájputs; thereby throwing all his events forward one year, excepting such as fall in the months *Pausha*, *Mágha*, *Phálgun*, and half of *Chaitra*, subsequent to A. D. 1752. He himself notices here and there a discrepancy of one year with the Musalmán historians, which is generally attributable to this cause alone.

Capt. Fell always uses the correct formula, having had access to

* In a previous part of the very same volume, p. 47, Wilford had used 57. In some places he makes the epoch of the *Kali yuga* 3001 instead of 3101.

† There is another advantage in adhering to the difference 57 in general terms rather than the *now* correcter number $56\frac{3}{4}$, namely, that before the year 1752 it was customary, in England and most parts of Europe, to commence the year in the month of March, or on the Easter moon; so that for all dates anterior to that period the European year may be accounted to have agreed with the Hindu luni-solar reckoning precisely.

native almanacs or to pandits. Mr. STIRLING, in his Account of Orissa, has the right epoch of the *Kali yuga*; but he applies a wrong equation (+77) to the *Saca* era of his Orissa rájas. It is possible that this may be the mode of reckoning in that province; for we find the *Saca* vary a year or two also in Burmah and Java, if these variations are not indeed attributable to our English references; for, as we have seen above, they are by no means infallible!

The term *Samvat* does not apply exclusively to the era of VIKRAMA'DITYA. COLEBROOKE first corrected this erroneous supposition in regard to the *Samvat* of the *Gaur* inscriptions, which probably commenced with the *Bhupála* dynasty, about 1000 A. D. Colonel TOD has also established the fact of a Balabhi *Samvat* in Gujerát, dating in 318 A. D., and a Siva Singha *Samvat*, in the same country, coinciding with 1113 A. D. This circumstance must be particularly attended to in examining ancient documents.

KIRKPATRICK mentions, that RAGHAVA DEVA introduced *the Samvat era* into Nepal; adding, that the *Newár* era is however generally used there, its origin being unknown. Now in the list of Nepal rájas, from HARA SINHA DEVA, A. D. 1323, back to RAGHAVA DEVA, there are but three reigns of extravagant lengths, viz. of 88, 85, and 80 years: if these be cut down to the usual average, the date of RAGHAVA will fall about 880, which is the epoch of the *Newár* era, so that in all probability the term *Samvat* in this case merely applied to the latter era, and not to that of VIKRAMA'DITYA.

It is frequently the custom in eastern authors to estimate dates backwards from the epoch of the writer or compiler. Thus, in the Buddhist chronology of Tibet, translated in M. CSOMA's Tibetan Grammar, we find "from the incarnation of SHÁKYA 2647 years," meaning anterior to A. D. 1686. In these cases, and particularly where time is estimated in cycles, great caution is necessary in fixing the initial date, and it is not improbable that from this source has arisen much of the confusion of Hindu chronology; as, for instance, from throwing back the origin of the *Kála chakra* system, or Jovian cycle of 60 years, which is traced (see page 29) to the year A. D. 965, as far as regards its introduction into India. Individual inaccuracies are hardly to be wondered at where events are chiefly chronicled from after-recollection. Thus the bard CHAND is 100 years out in one place, according to TOD. AMEER KHAN's Biography is one year out for a long period, and endless instances of the same inaccuracy might be adduced. The Muhommadans are generally very particular in their dates, and so are the Hindus where they inscribe a deed on brass;—in

this case they frequently allude to some eclipse or full moon, the act of donation being more pious for its occurrence on a religious festival.

It is hardly necessary to enumerate the authorities for the different catalogues to which we may now proceed, since they will be mentioned under each dynasty: but it may be as well to premise, that *A. A.* against a name or date denotes *Ayín Akberí; F. Ferishta's history; J. Jones; Wd. Wilford; B. Bentley; T. Tod; H. Hamilton;* and *W. Wilson.*

All dates have, for uniformity sake, been expressed in Christian years, which can readily be converted into the various native reckonings by the rules given in page 40.

As a convenient preface to the mythological catalogues of the Solar and Lunar dynasties, a tabular sketch of the Hindu Theogony, with a few additional memoranda regarding their sacred works, &c. have been inserted. For more ample details on this subject, Moore's Hindu Pantheon, and Coleman's Mythology, or the standard work of Ward on the Hindus may be consulted; while for the Pauranic genealogies at length, the elaborate tables published by Dr. Hamilton, at Edinburgh, in 1819, although inconveniently expanded in dimensions, will be found the most complete and authentic reference. The tables of Sir Wm. Jones, Wilford, and Bentley, in the Asiatic Researches, have the addition of dates; but as before remarked, these are hardly admissible in the earlier periods of fabulous history.

In regard to the tables of the Muhommadan sovereigns, it has been thought sufficient, as their history is so readily accessible, to insert merely their names and titles at length, to facilitate the identification of coins, &c. where frequently only a part of the title is visible. To connect the line of these intruders into Hindusthán, it was also unavoidable to carry back the list to the Persian, the Arsacidan, Syrian, and Bactrian monarchies; for, although properly speaking beyond the limits of India, their history is, from the time of Alexander, continually mixed up with that of the rich and fruitful country so constantly the prey to their invasions and plunder.

For the concluding catalogue of important events in the history of British India, we are indebted to Captain Henderson's list, published in the Calcutta Quarterly Magazine, which has been kindly revised for our work by the author himself.

Table XV. Hindu Theogony.

1. *The Infinite Almighty Creator, of the Vedas,* BRAHM.

The Hindu Trinity, or *Trimurti;*	Brahma',	Vishnu,	Siva.
Their consorts,	Saraswatí, Saktí, or Máyá,	Lakshmí, Padmá, or Srí,	Párvatí, Bhawáni, or Durgá.
Their attributes,	Creator,	Preserver,	Destroyer.
Their attendant *vahan* or vehicle,	*hansa*, a goose,	*garuda*, bird,	*nandi*, bull.
Their symbols,	time,	water,	fire.
Their stations,	Meru,	the Sun,	Jupiter.
Their common titles, .. A U M.	*Paraméswara*,	*Naráyana*,	*Mahádéva.*
Figure under which they are worshipped,	mentally,	*Sáligrám*, and 9 *avatáras*,	the *lingam*, under his million epithets.
Analogues in Western Mythology,	Saturn,	Jupiter,	Jupiter.

2. *Other members of the Hindu Pantheon, and their supposed analogues in western mythology, according to* Sir Wm. Jones.

Sareswati,	Minerva, patroness of learning,	Durga',	.. Juno.
Ganes'a,	Janus, god of wisdom. [&c.	Na'reda,	.. Mercury, music.
Indra,	Jupiter, god of firmament.	Krishna,	.. Apollo.
Varuna,	Neptune, god of water.	Bhawa'ni',	.. Venus.
Prithivi,	Cybele, goddess of earth.	Ka'li' or Durga',	Proserpine.
Viswakarma,	Vulcan, architect of gods.	Agni, ..	.. Vulcan, fire.
Ka'rtikeya, or Skanda,	Mars, god of war.	Swa'ha',	.. Vesta, (his wife.)
Ka'ma,	Cupid, god of love.	Aswini-kuma'ra,	Castor & Pollux.
Surya, or Arka,	Sol, the Sun.	Aruna, ..	.. Aurora.
Hanuma'n, son of Pavana,	Pan, the monkey god.	Atavi devi,	.. Diana.
Ra'ma,	Bacchus, god of wine.	Kuve'ra,	Plutus, god of riches.
Yama,	Pluto or Minos.	Ganga',	.. the river Ganges.
Heracula,	Hercules.	Va'yu,	.. Æolus.
Aswiculapa,	Æsculapius? (genii)	Sri', ..	.. Ceres.
Vaitarini,	The river Styx.	Anna purna,	Anna Perenna.

3. The ten Brahma'dicas, *children of Brahmá, or* Praja'patis, *lords of created beings.*

1	Maríchi,	*morality.*	6	Kritu,	*piety.*
2	Atri,	*deceit.*	7	Daksha,	*ingenuity.*
3	Angirasa,	*charity.*	8	Vasishtha,	*emulation.*
4	Pulastya,	*patience.*	9	Bhrîgu,	*humility.*
5	Pulaha,	*pride.*	10	Nárada,	*reason.*

4. The seven Menus, *of the present creation.*

1	Swayambhuva,	*Adam?* 4006 B. C.
2	Swárochesha,	
3	Uttama,	
4	Támasa,	*Chaos, Thaumaz* of Egypt?
5	Raivata,	
6	Chakshusha,	
7	Vaivaswata, or Satyavrata,	*Noah?* 2950 B. C.

5. The seven Ri'shis, *sprung direct from Brahmá.*

1	Kasyapa,	Muni.
2	Atri, ..	Muni.
3	Vasishtha.	
4	Visvamitra.	
5	Gautama.	
6	Jamadagni.	
7	Bharadwája.	

6. The ten Avata'ras, *or incarnations of Vishnu.*

1	Matsya, ..	*the fish.*
2	Kurma, ..	*the tortoise.*
3	Váráha, ..	*the boar.*
4	Narasinha,	*the lion.*
5	Vámana, ..	*the dwarf.*
6	Parasuráma,	*son of Jamadagni.*
7	Ráma, ..	*of the solar race.*
8	Krishna, ..	*of the lunar race.*
9	Buddha, ..	*of the Buddhists.*
10	Dharma-bhushana or Kalki-avatár,	*to appear at the close of the Kali yuga.*

7. The eleven Rudras, *or forms of Siva.*

1	Ajaikapáda, ..	The names are differently given in the *Bhágavat.*	———
2	Ahivradhna, ..		———
3	Virupáksha, ..		———
4	Sures'wara, ..		Mohana.
5	Jayanta, ..		Bama.
6	Bahurúpa, ..		———
7	Tryambaka, ..		Bhawa.
8	Aparájita, ..		Aja.
9	Savrita, ..		Rawati.
10	Hara, ..		Ugra.
11	Isha, ..		Bhíma.

8. The eight Vasus; *a kind of demi-god.*

1	Dhava, ..	5	Anila, or *wind.*
2	Druva, ..	6	Anala, or *fire.*
3	Sóma, the moon, ..	7	Prabhúsha.
4	Vishnu, ..	8	Prabhava.

9. The ten Vishwas, *a class of deity worshipped in funeral obsequies.*

1	Vasu, ..	6	Káma.
2	Satya, ..	7	Dhriti.
3	Kratu, ..	8	Kuru.
4	Daksha, ..	9	Pururava.
5	Kála, ..	10	Madrava.

10. The eight Dikpa'las, *guardians, and the* eight Dikpatis, *lords, of the cardinal points.*

1	Indra,	*east.*	1	Surya,	*the Sun.*
2	Agni, (or Vahni,)	*south-east.*	2	Sukra,	*Venus.*
3	Yama,	*south.*	3	Mangala,	*Mars.*
4	Nairrita,	*south-west.*	4	Ráhu,	*asc. node.*
5	Varuna,	*west.*	5	Sani.	*Saturn.*
6	Marut,(Vayu, Pavan,)	*north-west.*	6	Chandra,	*the Moon.*
7	Kuvera,	*north.*	7	Budha,	*Mercury.*
8	Isána, (Prithivi,)	*north-east.*	8	Vrihaspati,	*Jupiter.*

11. The twelve A'dityas; *monthly names or emblems of the Sun.*

1 Varuna.	5 Indra.	9 Swarnareta.
2 Surya.	6 Ravi.	10 Divakara.
3 Vedanga.	7 Gabhasti.	11 Mitra.
4 Bhánu.	8 Yama.	12 Vishnu.

12. The 27 Nakshatras, *daughters of Daksha, or lunar mansions.*

1 Aswini.	10 Maghá.	19 Múlá.
2 Bharani.	11 Purva Phálguni.	20 Purva A'sárha.
3 Kritika.	12 Uttara Phálguni.	21 Uttara A'sárha.
4 Rohini.	13 Hasta.	22 Sravana.
5 Mrigasira.	14 Chitra.	23 Dhaneshtha.
6 Ardra.	15 Swati.	24 Satabhisha.
7 Punarvasu.	16 Visákha.	25 Purva Bhadrapada.
8 Pushya.	17 Anuradha.	26 Uttara Bhadrapada.
9 Aslésha.	18 Jayeshtha.	27 Revati.

13. The names of Buddha.

Buddha, Sákya-muni or Sinha, Gautama, Tathágata, Mahá-sramaña; Saudhodani, from his father Sudhodhana; Arkabandhu, or kinsman of the Sun; Máyá-devi-suta, or child of Máyá.

But, of the Musalmáns.
Buddas and Sarmanes, of the Greeks.
Mercurius Mayæ filius, of Horace.
Bud or Wud, of the pagan Arabs.
Woden, of the Scandinavians.
Toth, of the Egyptians.
Fo, Foe, or Fo-hi, and Sa-ka, of the Chinese.
Pout, of Siam.
Sommonokodam, of ditto.
Godama, of Ava.
Xaka, of Japan.
Chakabout, of Tonquin China.
Chom-dan-das, Sangs-gyas, } of Tibet.

Bauddha System of Theogony.

Adi-buddha, the Supreme Being, created by *dhyan* five divine Buddhas, who are quiescent: viz.

		Each of whom produced from himself his son, or *Bodhisatwa*,	
1	Vairochana Akshobhya.		1 Samanta Bhadra.
2	Ratna.		2 Vajra Pani
3	Sambhava.		3 Ratna Pani.
4	Amitabha.		4 Padma Pani.
5	Amogha Siddha.		5 Viswa Pani.

The *Buddhist Triad*, or mystic syllable A U M, is interpreted:—
A, the *Vija mantra* of the male *Buddha*, the generative power.
U, ditto of the female *Dharma* or *Adi Prajni*, the type of productive power.
M, ditto of *Sanga*, the union of the essences of both.

The seven human or earth-born Buddhas.

1 Vipasya.
2 Sikhi.
3 Viswa Bhu.
4 Karkut Chand.
5 Kanaka Muni.
6 Kasyapa, and
7 Sa'kya Sinha.
A'rya Maitri, the future Buddha.

14. The 24 Jinas or Tirthankaras, *of the Jains.*

		where born.	*where died.*
1	A'dináth or Rishabhanáth, ...	Ayodhya,	Gujerát.
2	Ajitanáth, ...	do.	Mt. Síkhar [hod.
3	Sambhunáth, ...	Sáwanta,	Parisnáth.]
4	Abhinandananáth,.....	Ayodhya,	do.
5	Sumatináth, ...	do.	do.
6	Padmaprabhunáth, ...	Kausambhí,	do.
7	Suparswanáth, ...	Benares,	do.
8	Chandraprabha, ...	Chandripur,	do.
9	Suvidhanáth or Pushpadanta,....	Kakendrapuri,	do.
10	Sitalanáth,.....	Bhadalpur,	do.
11	Srí Ansanáth, ...	Sindh,	do.
12	Vasupádya, ...	Champapurí,	Champapurí.
13	Vimalanáth, ...	Kumpalapurí,	Mt. Síkhar.
14	Anantanáth, ...	Ayodhya.	do.
15	Dharmanáth,.....	Ratanpurí,	do.
16	Santanáth,.....	Hastinapur,	do.
17	Kunthunáth,.....	do.	do.
18	Aranáth, ...	do.	do.
19	Mallináth,.....	Mithila,	do.
20	Munisuvrata,.....	Rájgriha,	do.
21	Nemináth,.....	Mithila,	do.
22	Namináth,.....	Dwárika,	Mt. Girinára.
23	Parswanáth, ...	Benares,	Mt. Síkhar.
24	Vardhamána or Mohávíra Swámi,	Chitrakôt.	Pawapuri.

15. The Sapta Dwi'pas *or divisions of the ancient world, ruled by the sons of* Priyabrata, *king of* Antarve'da.

Oldest division.		*Newer division.*	
Jambudwípa,	India.	*Jambudwípa,*	India.
Angadwípa,	Nipal?	*Plakshadwípa,*	Asia minor, W.
Yamadwípa,	Assam, Ava?	*Salmalidwípa,*	Ceylon? W.
Yamaladwípa,	Malaya.	*Kushadwípa,*	Assyria, Persia, &c.
Sankhadwípa,	Africa.	*Karanchadwípa,*	near the Baltic? W.
Kúshadwípa,	Assyria.	*Sákadwípa,*	part of Kushadwípa, Britain? W.
Varáhadwípa,	Europe.	*Puskaradwípa,*	.. ditto Ireland? W.

16. The Four Vedas.

1 The *Rig véda.*
2 The *Yajur véda.*
3 The *Sáma veda.*
4 The *Atharva veda.*

17. The Four Upave'das.

1 The *Ayush,* .. medicine.
2 The *Gándharva,* music.
3 The *Dhanush,* .. warfare.
4 The *Sthápatya,* mechanics.

18. The Six Angas, *or bodies of learning.*

1 *Siksha,* pronunciation.
2 *Kalpa,* religious acts.
3 *Vyákarana,* grammar.
4 *Khandas,* prosody.
5 *Jyotish,* astronomy.
6 *Nirukti,* interpretation of Védas.

19. The Four Upa'ngas.

1 *Purána,* history, comprising the 18 puránas.
2 *Nyáya,* logic, and the principles of knowledge.
3 *Mímánsá,* religious principles and duties.
4 *Dhrma shástra,* law, human and divine.

20. The Eighteen Pura'nas.

1 *Brahma-purána.*
2 *Padma,* or lotus.
3 *Brahmanda,* egg of Brahma.
4 *Agneya,* or Agni, fire.
5 *Vaishnava,* or Vishnu-purána.
6 *Garuda,* Vishnu's bird.
7 *Brahmavaivarta,* or transformations of *Krishna* (as the supreme).
8 *Saiva,* or of Síva.
9 *Linga* purána.
10 *Náradíya.*
11 *Scanda.*
12 *Márkandéya.*
13 *Bhavishya,* prophetic.
14 *Mátsya,* or the fish.
15 *Váráha,* or boar.
16 *Kaurma,* or Kurma, tortoise.
17 *Vámana,* or dwarf.
18 *Bhágavat,* or life of Krishna.

21. *The six Principal Sects of the Hindus.*

1	Saiva,	worshippers of Síva, in his thousand forms.
2	Vaisnava,	 Vishnu.
3	Sauriya,	 Surya, or the Sun.
4	Gánapatya,	 Ganesha.
5	Sacta,	 Bhawání, or Párvatí.
6	Bhagavati,	 who recognize all 5 divinities equally.

PAURA'NIC GENEALOGIES.

TABLE XVI. DESCENDANTS of SWAYAMBHUVA, *the first Manu, King of Brahmavarta, and progenitor of mankind, (Adam ? J.) according to the Bhagavat Purána,* H.

BRAHMA.

SWAYAMBHUVA.

UTTAMAPADA, king of Bharatkhanda. (*From whom descended the Kings of Brahmavarta.*)	PRIYAVRATA, king of Antarvéda*. AGNIHIDRA, king of Jambudwipa. (*From whom descended the Kings of Bharatkhanda.*)
Dhruva.	Nabhi.
Vatsara.	Rishabha-deva†.
Pusparna.	BHARATA.
Vyushta.	Vridhaséna.
Sarvatajas.	Devatajit.
Chaxusha.	Devadyumna.
Ulmuka.	Purmeshthi.
Angga.	Pritiha.
Vena-adharmarata.	Pritiharta.
Prithu.	Bhuma.
Vijilaswa, or Antardhyana.	Udgitha.
Havirdhana.	Prastawa.
Varhishata, or Prachinkarhi.	Bibhu.
Pracheta, and 9 brothers.	Prathusena.
DAKSHA Prajapatí, *among whose numerous progeny were,*	Nakta.
10 daughters, married to DHARMA:	Gaya.
13 daughters, married to KASYAPA MUNI, the son of MARICHI, (see Solar race,) progenitors of men, animals, vegetables, &c.	Chitraratha.
Daná, mother of evil genii, comets, &c.	Sumrata.
Dití, mother of the *Daityas*, or *Asuras*.	MARICHI. (See Solar race.)
Aditi, mother of the gods and *Suras*.	Binduma.
27 daughters, the *Nakshatras*, married to the Moon.	Madhu.
1 daughter, mother of the 11 Rudras, and others of less importance.	Viravrata.
	Manthu.
	Bhauvana.
	Twashtha.
	Viraja, and 100 sons, whose names are unknown.

* Priyavrata was also father of Idhmajabha, king of *Plaxa dwipa;* Yagyabahu, of *Salmala dwipa;* Hiranyarita, of *Kusa dwipa;* Ghritaprishtha, of *Karangcha dwipa;* Medhatithi, of *Saka dwipa*, and Bitihotra, of *Puskara dwipa;* of whom the descendants are not traced farther than the first generation.

† Rishabha-deva was also father of the kings of various other nations, viz.: Kus-warta, of *Kus-warta-dés;* Ila-warta, Brahma-warta, Malaya, Ketu, Bhadraséna, Indrasprik, Bidharbha, and Kikata, of *dés*a, or countries, bearing the same names: besides the nine immortal *siddhas*, Kabiyaga, Hari, Antarixa, Prabuddha, Pippulayana, Abirhotra, Dranila, Chumasa, and Karubhajana: also 81 brahmans, names unknown.

Table XVII. The Surya-vansa, *or* Solar Dynasty,

collated from the lists of Jones, Wilson, Tod, and Hamilton.

Marichi.

Kasyapa Muni, married Aditi', Daksha's daughter, (see Table xvi.)

Vivaswana, or Surya, the Sun.

Sradhadeva, or Vaivaswata, (the sun) *king of Ayodhya.*

Ixwaku, *in the Treta yuga.*—B. C. 3500, J.—2200, T.

From whom sprung the two Solar Dynasties

Of Ayodhya, (Oude.)	*Of Maithila*, (Tirhut.)
Vikuxi, (did not reign, W.)	Nimi.
Kukutst'ha, or Puranjaya.	Janaka, built Janakpur.
Anénas, Prit'hu, An-Prithú, T.	Udvasu.
	Nandiverdhana.
Viswagandhi, Visvagaswa, W.	Suketu.
Chandra, Ardra, T. W. / Bhadrardra, W.	Dewarata.
	Vrihadratha.
Yuvanáswa,	Mahabirya.
Sráva, Svasava, H.	Sudhrita.
Vríhadas'wa,	Dhristaketu.
Dhundhumara, Kuvalayáswa, W.	Haryaswa.
Drid'hás'wa,	Maru.
Haryas'wa,	Pratipaka.
Nikumbha,	Kritiratha.
Cris'áswa, Varunaswa, T. H. / Sankataswa, W.	Devamirha.
	Visruta.
Senajit, Prasenajit, W.	Mahadhrití
Yuvanáswa, H. W. *car.* J.	Dhritiratu.
Mándháta, Suvindhu, T. / King of *Saptadwípa.*	Maharoma.
	Swarnaroma.
Purukutsa,	Haraswaroma.
Trasadasyu, *car.* T.	Swadhaja, father of Si'ta', who married Ra'ma. (see the parallel line of *Ayodhya.*)
Anaranya,	
Prishadaswa, W.	
Haryas'wa, H. W.	
Praruna, Aruna, H. Vosumána, W.	
Trivindhana, Tridhanwa, W.	
Satyavrata, Tràyaruna, W.	Kesidhaja.
Suvritha, T. *car.* J. H. W.	Dharmadhwaja.
Tris'anku,	Kritadhwaja.
Harischandra, king of India.	Kesidhwaja.
Róhita, Kohitaswa, H.	Bhanuman.
Háríta,	Satadyumna.
Champa, Chunchu, W.	Suchi.
Sudéva, *car.* T. W.	Sunadhwaja.
Vijáya, (his brother; *Kurm. Pur.*)	Urdhaketu.
Bharuca,	Ayu.
Vrika,	Purajit.
Báhuka, Bahu, W.	Arishtanemi.
Sagara, had 10,000 sons.	Srutayu.
Asamanjasa, only survivor.	Supanswaka.
Ansumán,	Chitraratha.
Dulipa, W. T. H. *car.* J.	Kshemadhi.
Bhagirat'ha, brought down Ganges river.	Samaratha.
Sruta,	Satyaratha.
Nábhaga,	Upa guru.
Ambarisha, T. W.	Upajupta.
Sindhudwípa,	Baswananta.
	Yugudhana.

This list is imperfect in number, if the father of Si'ta the bride of Ra'ma be correctly placed.

Ayodhya rájas, continued.

Ayutáyush,
Ritaperna,
Nala, T.
Sawakáma, W. T. } *car.* J. H.
Saudása,
Kalmáshapáda, W. H. *car.* J. T.
Asmaka,
Múlaca, Harikavacha, W.
Das'arat'ha,
Aídabida, Ilivita, W.
Vis'wasaha,
K'hatwánga, Kharbhanga, T.
Dirghabáhu,
Raghu,
Aja,
Das'arat'ha, II. W.
RA'MA, A. C. 2029, J. 950, B. 1100, T. { his brothers Bharata, Lakshmana, Satroghana,

Dwápár yuga or brazen age.

Kusha, Lava, T.
Atithi,
Nishadha,
Nabhas, or Nala, T.
Pundarika,
Xemadhanwas,
Dévánica, Dwarika, W.
Ah'inagu, Ahinaja, W. Hina, H.
Kuru, W. *car.* J. H.
Páriputra,
Dala, W. Bala, H.
Rana-chhala,
Uktha, W. *car.* J. H.
Vajranabha,
Arca, *car.* W. T. H.
Sugana, Sankhanábhi, W.
Vidhrití, Vijuthitábhi, W.
Viswasaha, II. W. Visitaswa, T.
Hiranyanábha,
Pushpa, Pushya, H.
Dhruvasandhi, *car.* T.
Suders'ana, *car.* W.
Agniverna, Apaverma, W.
Sighra,
Manu, Maru, W. T. H.
Prasusruta,
Sandhi, .. Susandhi, W.
Amers'ana, Amersha, W.
Mahaswat, Avaswana, T.
Vis'wabháhu, Prasénajit, TACSHACA, } Viswasava, T. *carent*, W.
Vrihadbala,
Vrihadsan'a, B. C. 1300 JONES.

Mithila rájas, continued.

Subhasana.
Sruta.
Jaya.
Vijaya.
Ritu.
Sunaka.
Bitahalya.
Dhriti.
Bahulaswa.
Kriti.
Mahabasi.

SOLAR LINE OF VESALA, *(also descended from Sradha-deva.)*

Dishta, king of Vesala.
Nabhaga.
Bhalandana.
Vatsaprité.
Prangsu.
Pramati.
Khanitra.
Chaxusha.
Bibingsati.
Rambhu.
Khaninetra, Dharmika, } *car.* Vansaláta.
Karandhama.
Adixita.
Maruta.
Dama, Rajyavarodhana, } *car.* do.
Sudhriti.
Nara, *car.* do.
Kebala.
Dhundhumana, or Bandhuman.
Begawan, Budha, Trinavindhu.* } *car.* do.
Besabiraja, or Visala, who founded *Vaisali*, (Allahabad.)
Hemachandra.
Dhumraxa.
Sangyam.
Sahadeva, *car.* V. L.
Krisaswa.
Somadatta.
Sumati, (ends V. L.)
Janamejaya.

* His daughter, Brabira, married Visvarawa Muni, the father, (by another wife, Nikaxá,) of RA'VANA the demon king of *Lanka* or Ceylon, afterwards killed by RA'MA.

Kali yuga—iron, or *fourth age*, 3101 B. C.

Urukriya, Uruxepa, W.
Vatsa, W. *car.* J.
Vatsa-vriddha, Vyúha, W.
Prativyóma,
Bhánu, *car.* W.
Dévácа. *car.* T.
Sahadéva,
Víra, *car.* W. T.

} Bentley places these 8 names immediately after Ra'ma.

Vrihadas'wa.
Bhánumat, *Bahman*, Longimanus of Persia? T.
Prat'icás'wa, *car.* W.
Supratíca,
Marudéva,
Sunaxatra,
Pushcara, Kesinara, W.
Antaríxa, Rekha, T.
Suta, Sutapas, Suverna, W.
Amitrajit,
Vrihadrája,
Barhi, Dherma, W.
Kritanjaya, first emigrant from Kosala, (Oude) and founder of the Suryas in Saurashtra, T.
Rananjaya,
Sanjaya,
Slócya, Sakya, W. T.
Suddhóda, Kroddhodana, W. Sudipa, T.
Lángalada, Sangala, T. Ratula, W.
Prasénajit,
Xudraka, Romika, T.
Kundaka, W. *car.* J.
Surita, W. *car.* J.
Sumitra, B. C. 2100, J. 57, T. The last name in the *Bhágavat Purána*, said to be contemporary with Vikrama'ditya ? T. from this Prince the Mewár chronicles commence their series of Rajás of Saurashtra ; see Table xxvi.

Table XVIII. Chandra-vansa, Indu-vansa, *or* Lunar Race, *who reigned in Antarvéda and Kásí ; afterwards in Magadha, (Behar,) and Indrapreshtha, (Delhi.)*

Atri', Muni.
Soma, (*Lunus*, the Moon.)
Buddha, (Mercury) married *Ilá* daughter of the Sun.
Ailas, or Purúravas.
Ayu, Kings of Kási also descended from him, (see below.)
Nahusha, (*Devanahusha*, Dionysos, Bacchus, Wd.)
Yayati, father of Puru and Yadu, (see next page.)

Kings of Kási, (Benares.)

Xetravriddha, son of Ayu.
Suhatra.
Kási.
Kási.
Rashtra.
Dirghatama.
Dhanwantra.
Ketumana.
Bhimaratha.
Divoda'sa, becomes a Buddhist.
Dyamana.
Pratardan.
Ritadwaja.
Alarka.
Santati.
Sunitha.
Suketana.
Dharmaketu.
Satyaketu.
Dhrishtaketu.
Sukamara.
Bitihotra.
Bharga.
Bhargabhumi, (end in Bhágavat, P.)

Line of Puru.

PURU, king of *Prátishthána.*
Janamejaya, king of *Antarveda.*
Prachinwat,
Pravira,
Manasya,
Abhayada,
Sudhyumna,
Bahugava,
Samyáti,
Dhamyáti,
Raudrásva,
Ritéya, *car.* W.
Rantibhara, Rantimara, W.
Sumati, Tansa, W.
Raibhi or Ailina, *car.* W.
Dushmanta or DUSHYANTA, husband of *Sakuntalá.*
BHARATA, king of *Antarveda* and *India.*
Vitatha, or Bharadwaja, adopted.
Manya,
Vrihatxetra,
Suhotra,
HASTI, built *Hastinapur.*
Ajámirha, reigned at do.
Rìxa, do.
Samvarana.
KURU, from whom also descended the *Magadha* princes, see tab. xx.
Jahnu,
Suratha,
Viduratha,
Sarvabhauma,
Jayatséna,
Radhica, Arávi, W.
Ayutáya, Ajita, H.
Krodhana,
Devatithi, *car.* W.
Rixa,
Bhimaséna, *car.* J.
Dilipa,
Pratipa,
SANTANU, incarnation of Varuna, *from whom* 2 *sons.*

Dhritarishta, Vichitravirya, *whose* Duryodhana. *daughter married* VYA'SA, *and bore* PANDU, *whose wife bore the five Pandavas,* viz :

1 YUDHISHTHIRA, (see Table xix.)
2 ARJUNA, father of Parixita, (see do.)
3 BHI'MASENA, no descendants.
4 NAKUL, and
5 SAHADEVA, } founded the *Magadha* line, (Tab. xx.)

Line of Yadu.

YADU, excluded from succession.
Kroshta,
Vrijinavan,
Swáhi,
Rishadyu,
Chitraratha,
SARAVINDU,
Prithusravas,
Tamas, or Dharma.
Usanas,
Síteshu, Síteyas, W. *car.* H.
Ruchaka, Rukshma, W.
Kavalha, W. *car.* J.
Parávrata, line extinct.
Jamodhya, Jyamagha, W; from Saravindu by another line.
Vidarbha,
Krotha,
Kunti,
Drashti, Vrishni, W.
Nirvrati,
Dashárha,
Vyoma, Víjaman, W.
Jimutra,
Vikrati,
Bhímaratha,
Navaratha,
Dasaratha,
Sakuni,
Kusambha,
DEVARATA,
Devaxetra,
Madhu,
Anavaratha,
Kuru-vatsa,
Anuratha,
Puruhotra,
Ayu, Angasa, W.
Satwata, (several branches.)
Andhaka, ditto.
Bhajamána,
Viduratha,
Sura,
Sami, Samana, W.
Pratixetra,
Swayambhuva,
Hridika, (several branches.)
Devamida,
Sura, (numerous progeny by Marusá.)
Vasudeva, the eldest, who had 13 wives.
KRISHNA and BALARA'MA, with whom this line becomes extinct, by quarrel of the *Yádus.*

Synchronisms of the Solar and Lunar races, T.

T. { Budha of the Lunar race married Ilá, the sister of Ixwaku, s. l.
Harischandra, s. l. cotemporary of Parasuráma, of lunar line.
Sagara, cot. of Taljanga, of do.
Ambarisha, cot. of Gadhi, founder of Canauj.

Table XIX. Pandu Dynasty *of* Indraprestha, *or Delhi.*

Continued from the line of Puru *of the Chandra vansa, or Lunar line, and collateral with the Magadha Princes, descending from* Jarasandha, *of Tab.* xx.
According to the Bhágavat Purána, H. *According to the Rájavali,* T.

Yudhisthira, 1*st King of Indrapreshta—no issue.*

B. C. 3101	J. Parixita, son of Arjun, succeeds.	Parixita.
1300	W. Janamejaya, W.	Janameja.
1100	T. Satanika,	Asmund.
	Sahasranika, *car.* W.	Adhuna.
	Aswamedhaja,	Mahajuna.
	Asimakrishna, Nichakra, W.	Jesrita.
	Nemi, king of *Hastinapur,* (washed away.)	Dehtwana.
	Chakra, built *Kausambhi.*	Ugarséna.
	Ukata, king of *Kausambhi,* Ushna, W.	Surséna,
	Chitraratha,	Sutasshama.
	Kabiratha, *car.* W.	Résmaroja.
	Vrishnemana, Dhrihtimán, W.	Bachil.
	Susena,	Sootpála.
	Mahipati, *car.* W.	Narhurdéva.
	Sunitha,	Jesrita.
	Sukhinala, { Richa, W. / Nrichaxu, W. / Sukhavatí, W. }	Bhupata. Seovansa. Médavi.
	Pariplawa,	Sravána.
	Sunaya,	Kíkan.
	Medhabi,	Pudhárat.
	Nripanjaya,	Dasunama.
	Durba, Mridu, W.	Adelika.
	Timi, Tigma, W.	Huntavarnu.
	Vrihadratha,	Dandapála.
	Sudasa, Vasudána, W.	Dunsála.
	Satáníka,	Sénpála.
	Durdamana, Udayana, W.	Khévanraj, *deposed, and Pandu line ended.* T.
	Bahinara, Ahinara, W.	
	Dandapáni,	
	Nimi, Niramitra, W.	
	Xemaka, *car.* W.	

The Rájavali continues the Indraprestha sovereigns of the Lunar race, through three more Dynasties, T. *viz.:*

Second Dynasty, 14 princes, *reigned* 500 years.	*Third Dynasty.*	*Fourth Dynasty.*
Viserwa, (contemporary with Sisunága? T.)	Mahraje, Maharaje of Ferishta? T.	Séndhwaja.
Surien.	Srísena.	Mahánganga.
Sírsah.	Mahipála.	Náda.
Ahangsal.	Mahávali.	Jewana.
Vyerjíta.	Srupvarti.	Udiya.
Durbara.	Netraséna.	Jehala.
Sodpala.	Samukdana.	Ananda.
Sursana.	Jetmala.	Rájpála, invaded Kemaon, and killed by Sukwanti, who seized on Indrapreshtha, whence he was expelled by Vikramáditya, T.
Singraja.	Kálanka.	
Amargoda.	Kalmana.	
Amarpála.	Sirmandan.	
Sérbéhé.	Jeywanga.	
Padharat.	Hergúja.	
Madpál, slain by his Rajput minister.	Hírasena.	
	Antinai, resigned to his minister.	

TABLE XX. KINGS OF MAGADHA, *or Central India, hod. Behar, of the* INDU, *or* CHANDRA VANSA, *Capital, Rdjagriha.*

Barhadratha Dynasty, (see Tab. xviii.)

CURU.
Sudhanu.
Suhotra.
Chyavana.
Kritadha.
Visruta.
Uparichara.
Cushágra.
Vrishabha.
Pushpavana.
Satyasahite.
Urja.
Sambhava.

Line of Pandu, (*brought on from page* 97.)

JARASANDHA, *cot. of Yudhishthira and Krishna,* B. C. 3101 ? J.

B. C. 1400, W. SAHADE'VA, Parixita born, *great war* ends.
Márjári, or Somapi, W.
Srutaman.
Ayutaya.
Niramitra.
Suxatra.
Vrihat-karma, or -séna.
Senajit.
Srutanjaya.
Vipra.
Suchi.
Xemya.
Suvratha.
Dherma-sutra.
Nribhrata, WD.
Susrama.
Drirhaséna, Vrihadséna, WD.
Sumanti.
Suvala, Suddhamva, WD.
Sunita.
Satyájit.
Viswajit.
915. Ripunjaya, 700 WD. a Buddha born in his reign, As. Rs. II. 138.

Sunaka Dynasty, Kings of Bharatkhanda, reigned 128 *years.*

915. Pradyota, B. C. 700, WD. 650? Bud. Chron. 2100, JONES.
Pálaka.
Visákhyapa.
Janaka, Rajaca or Ajaca, WD.
Nandiverddhana, or Takshac, T.

Sisunágas or S'esnágs, reigned 360 *years.*

777. Sisunága, 1962, T. 550, WD. 472, B. } *car.* WD.
Káka verma, ... }
Xemadherma.
Xetranja.
Vidhisára.
AJATA SATRU, 450 WD. 551 Bud. Chron. of *Ava.*
Darbhaka, Dásaca.
Udayaswa, Udási, Ajaya.
Nandiverddhana.
Maha nandi, Mahabali, WD. 355.
Sumalya, or Vikhyaat, T.
415. NANDA, 1602 J. 340, W.
The nine Nandas, reigned 100 years.

Maurya Dynasty, governed 137 *years.*

B. C. 315. W. Chandragupta, Sandracottus of Greeks, 1502 J.
Várisára, Vindusára.
Asoka, patron of the Buddhists, 330, Bud. Chron.
Suyásas, Sujáswa, T. Culáta, Wd.
Dasaratha, *car.* T. Wd.
Sangata, Bandupálita, Wd.
Salísuka, Indrapálita, Wd.
Devadharma, Wd.
Somasermá.
Satadhanwa.
Vrihadratha.

Sunga Dynasty, 110 *years.*

178. Pushpamitra, 1365, J.
Agnimitra,
Suyeshtha, } Ustimitra, T.
Vasumitra,
Ardraka, Abhadraca, Wd. Badraka, T.
Pulindaka.
Ghosha-vasa.
Vajrámitra, Vicramitra, Wd.
Bhágavata.
Devabhúti.

Kanwa Dynasty, 45 *years.*

66. Vasudeva, 1253, J. *car.* T.
Bhumitra. cot. of Vikramáditya, T.
Nárayana, Parana, T. [*Sipraka.*)
Susarma, (Wilford supposes interval of 150 years before

Table XXI. Andhra *or* Vrispala Dynasty, *of Andhra, (Orissa?) or Telingana, in continuation of the Magadha line.*

(See Wilford's comparative list from the Bhágavat, and three other Puránas, in the 9th Vol. of As. Res.) The 30 generations occupy 456 years.

B. C. 21. Sipraka, Balin, Balihita, B. C. 908, J. A. D. 190, Wd.
Krishna.
Sátakarni.
Purnotsanga, Paurnamása, } *car.* W.
Sátakarna, ... }
Lombodara.
Vivilaca, Apilica, Wd.
Megha-Swati.
Putúmán.
Arishtakarna, *car.* Bhág. Purána.
Hála.
Puttalaka, Tiluk, T.
Pravillaséna.
Sundara-Sát-karna, II.
Chakora-Sát-karna, III.
Siva-swáti.
Gomatiputra, Gautami, Wd. A. D. 500.
Puliman Purimat.
Sát-karní, IV. *car.* Bhág. Purána.
Sivásrí.
Sivaskanda.

408. Yajnasrí. Yeug nai of Chinese? Wd.
Vijaya.

A. D. 428. Chandra-srí, or vijaya, last Magadha king, 300, J. 546, T.
Pulomárchhi, Poulomien of Chinese? Wd. dics, 648, A. D.
Salomdhi, T. cot. of Bappa Ráwal of Mëwár, A. D. 720?

TABLE XXII. RÁJAS *of* CASHMI'R, *of the Line of* CURU *in the Lunar race: worshippers of Nágas or Snakes.*

The Rája Taringini, whence this line is taken, commences with an account of the desiccation of the valley by CASYAPA MUNI: *supposed to allude to the deluge.*—WILSON, As. Rs. xv. 1.

First Period—Caurava race, 1266 years.

B. C. 3714 Cashmír colonised by Casyapa, B. C. 2666, W.

Fifty-three Princes, names omitted by Hindu writer, but partly supplied by Muhammedan authority, as follows:

Suliman.
Cassalgham.
Maherkaz.
Bandu-khan, (PANDU of the Lunar line?)
Ládi-khan.
Ledder-khan.
Sunder-khan,—Hindu worship established.
Cunder-khan.
Sunder-khan.
Tundu-khan.
Beddu-khan.
Mahand-khan.
Durbinash-khan.
Deosir-khan.
Tehab-khan, dethroned by king of Cabul.
Cálju-khan.
Luvkhab-khan.
Shermabaram-khan.
Naureng-khan, conquered China.
Barigh-khan.
Gowasheh-khan.
Pandu-khan, II. extended empire to the sea.
Haris-khan.
Sanzil-khan.
Akber-khan.
Jaber-khan.
Nauder-khan.
Sanker-khan, slain by
Bakra Rája.

an interval ensues, and authentic history commences with

2448 Gonerda, I. Kali Yuga, 653. Gonanda or Agnand, a relation of Jarasundha, 1400, W. B. C. 1045, P.
Damodara, 1st.
Gonerda, II.

Thirty-five Princes; names forgotten.

1709 Lava, (Bal-lava) Loo of Muhammedan historians. B. C. 570, P.
1664 Causésaya.
1660 Khagéndra.
1600 Suréndra, cot. with Bahman of Persia.
1573 Godhara, Gowdher, A. A.
1537 Suverna, Suren, do.
1477 Janaca, Jenak, do.
1471 Sachinara, Seijuner, do.
1394 ASOCA, established Buddhism. *(See pages* 78, 100, B. C. 250?*)*
1332 Jaloca, adopted castes.
1302 Dámodara, II. a Saiva; transformed into a snake.
1277 Hushca, Jushca, Canishca, } Tartar Princes, re-established Buddhism.
1217 Abhimanyu, an orthodox Hindu, B. C. 423, W. B. C. 73, P.

Second Period, Gonerdiya Dynasty, 1013 *years; or* 378 *years after adjustment*, W.

B. C. 1182	Gonerda, III. Nága worship resumed,		B. C. 388	W.108, P.
1147	Vibhíshana,		370	
1096	Indrajita,		352	
1060-6	Rávana,		334	
1030-6	Vibhíshana, II.		316	
993	Nara, (Kinnara) persecuted Buddhists,		298	
953-3	Siddha,		280	
893-3	Utpaláxa, Adutbulabeh,	A. A.	262	
862-9	Hiranyáxa, Teernya,	,,	244	
825-2	Hiranyácula, Herenkul,	,,	226	
765-2	Vásúcula, Ebeshak,	,,	218	
705-2	Mihirácula, invaded Lanka or Ceylon,		200	
635-2	Vaca,		182	
572-2	Xitinanda, (Nandana,)		164	
542-2	Vasunanda, Vistnand,	A. A.	146	
490	Nara, II. or Bara—Nir,	,,	128	
430	Axa, Aj,	,,	100	
370	Gopáditya, a pious brahmanist, Kulvarít,	A. A.	82	
310	Gokerna, Kurren,	,,	64	
253	Narendráditya, Nurundrawut,	,,	46	
216-9	Yudhisht'hira, surnamed the blind, (see Lunar race?)		28	

Aditya Dynasty, 192 *years.*

168-9	Pratápáditya, kinsman of Vicramáditya,		B. C. 10	W.
136-9	Jalaucas, Juggooh,	A. A.	A. D. 22	
104-9	Tunjína, a great famine, Bunjir,	,,	54	
66-9	Vijaya, Bejeery,	,,	90	
60-9	Jayéndra, Chander,	,,	98	
B. C. 23-9	A'rya Rája, of miraculous accession,		135	400, P.

Gonerdiya Line restored, 592 *years, or* 433 *adjusted.*

A. D. 23-3	Méghaváhana, Megdahen, A. A. invited Bauddhas, and invaded Ceylon.	
57-9	Sréshtaséna, or Pravaraséna.	
87-3	Hiranya, contention with Toramána *Yuvarája*, contemporary with Vicramáditya.	
117-5	Mátrigupta, a brahman from Ujjain, succeeds by election,	471 W.
122-2	Pravaraséna, invaded Siláditya of Gujerát, (tab. xxvii.)	476
185-2	Yudhisht'hira, II.	499
224-5	Nandrávat, Naréndráditya, or Lakshman'a,	522
237-5	Ranáditya, married daughter of *Chola* Rája,	545
537-5	Vicramáditya, supposed an interpolation (Ujain princes?)	568
579-5	Báláditya, last of the Gonerda race,	592

Nága or Carcota Dynasty, 260 *years*, 5 *months.*

A. D. 615-5	Durlabhaverddhana, contemporary with Yezdijird.	
651-5	Pratápáditya, founded Pratápapur. Durlabhaca, *car.* W.	
701-5	Chandrápíra, or Chandránand, a virtuous prince.	
710-1	Tárápíra, a tyrant.	
714-1	LALITA'DITYA, conquered Yasovarma of Canouj, (? Yasovig-	
750-8	Cuvalayápíra. [raha of inscriptions) and overran India.	
751-8	Vajráditya.	
758-8	Prithivyápira.	
762-10	Sangramápira.	
769-10	Jajja, an usurper, deposed by	
772-10	JAYA'PI'RA, married daughter of JAYANTA of Gaur, encouraged learning, invaded Bhíma Séna of Gujerát, 841?	
803-10	Lalitápíra.	
815-10	Sangrámápíra, II. or Prithivyápíra.	
822-10	Vrihaspati, or Chippatajaya, son of a prostitute, whose five brothers governed in his name.	

834-10 Ajitápíra, set up by the same usurpers.
870-10 Anangápíra, restored to the succession.
873-10 Utpalapíra, last of the *Carcota* race.

Utpala Dynasty, 84 *years*, 5 *months*.

875-10 A'ditya Vermá, or Avanti Verma, a severe famine.
904-1 Sancara Vermá, invaded Gujjara and Rája Bhoja, (? see *Málwá*,) Cashmír cycle brought into use, 59.
922-9 Gopála Vermá, killed youth.
Sancatá, last of the Verma race.
924-9 Sugandhá Ráni, recommended the election of
926-9 Párt'ha.—The *Tatris* and *Ecangas* powerful.
941-9 Nirjita Vermá, also called *Pangu*, the cripple.
942-9 Chacra Vermá, civil wars.
952-9 Sura Vermá.
953-9 Párt'ha, a second time.
954-3 Chacra Vermá, do.
954-9 Sancara Verdhana.
956-3 Chacra Vermá, a third time.
957-7 Unmatti Vermá.
959-9 Sura Vermá, II.

Last or mixed Dynasty, 64 *years*, 4 *months*.

960-3 Yasascara Déva, elected sovereign.
969-3 Sangrama Déva, dethroned and killed by
969-9 Parvagupta, slain at Suréswari Xétra.
971-3 Xemagupta, destroyed many *Viharas* of Buddhists.
979-9 Abhimanyu, intrigues and tumult.
993-9 Nandigupta, put to death by his grand-mother Diddá.
994-10 Tribhuvana, shared the same fate.
996-10 Bhimagupta, ditto.
1001-1 Diddá Ráni, assumed the throne herself, adopts
1024-7 Sangráma Déva, II. (with whom Wilson's list closes.)
1032 Harirája and A'nanta deva,* his sons, (continued from the printed *Taringini*.)
1054 Kalasa.
1062 Utkarsha, and Harsha deva.
1062 Udayama Vikrama, son of the latter.
1072 Sankha Rája.
1002 Salha, grandson of Udayama.
1072 Susalha, usurper, do.
1088 Mallina, his brother, (end of Kalhana Pandit's list.)
1088 Jaya Sinh, son of Susalha, (Jona Rája's list.)
1110 Paramána.
1119 Bandi deva.
1126 Bopya deva.
1135 Jassa deva, his brother, an imbecile.
1153 Jaga deva, son of Bopya.
1167 Rája deva.
1190 Sangráma deva, III. a relation.
1206 Ráma deva.
1227 Lakhana deva, adopted.
1261 Sinha deva, new line; killed by his brother-in-law
1275 Sinha deva, II. an usurper, who was himself deposed and killed by the *Mlechas* under Rája Dullach (?)

* The lengths of reigns only are given in the original: calculating therefore backwards from Ala-uddín, it becomes necessary to curtail the reign of Harirája, (52 years,) by about 30 years, to form a natural link with Wilson's date of Sangráma deva. P.

The Bhota Dynasty.

1294 Sri Rinchana, obtained throne by conquest.
1294 Kota Ráni, his wife.
Udyána deva, her second husband. Their minister, Shah Amír, killed the whole family, and succeeded under the name of Sri Shamsh uddín.
18 Musulman princes succeeded, names not recorded.
Vikhyana Bhatt, overcame the last of these.
1298 ? Jayansara, his son who was overcome by the Sultán
1300 Alla uddi'n, Muhammed Shah.

[The names of the Muhammedan chiefs, who held possession of the valley, sometimes independently, under the Patan and Moghel Emperors, are so disfigured in Nágari characters, as to be hardly recognizable. Jona Rája's list continues to Zein-ul-áb-ud-dín, 815 Hij. whence Sri Vara Pandit continues it to Fatteh Sháh, A. D. 1477. The *Rájavalí Patáca*, brings on the line to Akber's conquest in 1560, see Muhammedan dynasties.]

Table XXIII. Chohan *or* Chahuman Dynasty, *at Ajmír, Delhi, and afterwards Kotah and Bundí.*

The Chohans, one of the four Agnicula tribes, Chohán, Purihárs, Solánki and Pramára, said to have been produced by a convocation of the gods on mount Abu,—supposed of Parthian descent, Tod.

B. C. 700 Anala, or Anhul Chouhan, established at *Garra Mandela.*
Suvácha,
Mallan, source of Mallani tribe ?
Galan Súr.
A. D. 145 Ajipa'la, *Chakravartti*, founder of *Ajmír*, 202 of *Virát* era ?
500 Sámanta Déva,
Mahá Déva,
Ajaya Sinh, ? Ajipala.
Virá Sinh,
Vindasur,
Vairi Vihanta, } W.
684 Dola Raí, lost Ajmír to Muhammedans.
695 Manikya Rai', founded *Sámbhar:* hence title of Sámbrí Rao, slain by Moslem invaders under Abul Aás; eleven names only in Jáéga's catalogue, T.
Mahásinha.
Chandra Gupta, (of Allahabad pillar incription ? See Canouj.)
Pratáp Sinh.
Mohan Sinh.
Setarai.
Nágahasta.
Lohadhár.
Vira Sinh, II.
Vibudh Sinh.
Chandra Ray.
770 Harihara Ray, (Hursráj, T.) defeated Subactegín.
Basanta Rai.
Balianga Rai, (Belundeo ? T.) or Dheruca Gaj, slain defending
Pramatha Rai. Ajmír against Sultan Mahmúd.
Anga Raja, (Amilla Déva, Delhi inscription.)
1016 W. Visala De'va*, from inscriptions, 1031 to 1095, Tod. interpolated date in the books of *Chand*, S. 921.
Saranga Déva, a minor.
Ana Déva, constructed the Anah Ságar, at Ajmír.
Hispál, (of Ferishta) father of

* The lath of Firoz, bearing Visala Déva's name, is dated S. 1230, in the reign of Vigraha Rái Déva.

977 Jaya Sinh, (or Jypal of Ferishta, burned himself, 1000, see *Málwá*) extended his dominion to Lahore, &c.
1000 Ananda Déva, (or Ajay deo) Anandpál, F.
Soméswara, married daughter of Anangpál of Delhi.
1176 Prithiráy, of Lahore, obtained Delhi, slain by Shahábuddín, 1192.
1192 Rainasi, slain in the sack of Delhi, T.
Vijaya Ray, adopted successor of Plithiray, (see Delhi pillar.)
Lakunsi, thence 26 generations to Nonad Sinh, present chief of *Nímrána*, nearest lineal descendant of Ajipál and Prithiráj.

Table XXIV. Haravati *or* Harautí *branch of the* Chohan *Dynasty.*

The Haras are descended from Anura'ja, *a son of* Visalade'va *or more probably of* Ma'nikya Rai', T. *see preceding table.*

Anurája, took possession of *Asi*, or *Hansi*, in *Hariána.*
A. D. 1024 Ishtpála, obtained *Asérgarh*, miraculously.
Chand Karna.
Lok Pál.
1192 Hami'ra, (known in Prithirája wars ;) killed in 1192.
Kálkarna.
Mahá Magd.
Rao Bacha.
1298 Rao Chand, slain with all but one son by Alla-uddín.
1300 Rainsi, protected at *Chitor*, obtained *Bhynsror.*
Kolan, declared lord of the *Pathár*, (central India.)
1311 Rao Bango, took possession of the *Hun* court of *Mynál.*
Rao Déva, summoned to Lodi's court, abdicated to his son
Hara Rája, founded *Bundí*: country called *Haravati* after him.
Samarsi, (Samara Sinh,) conquered the Bhíls.
Napújí, feud with *Solankhi* chief of *Thoda.*
Hamú-jí, defied supremacy of Rána of *Mewár.*
Birsingh.
1419 Biru.
1485 Rao Banda, a famine, 1487, expelled by his brothers
Samarcandí and Amarcandí, who ruled 12 years.
Narain Dás, recovers *Bundí.*
1533 Suraj Mal, assassinated by *Chitor* Rána.
1534 Soortan, a tyrant, banished.
Rao Arjun, his cousin, killed in defence of *Chitor.*
1575 Rao Rája Surjan, *Chunar*, and *Benares* given to him.
Rao Bhoja, separation of *Bundí and Kota.*

Bundi branch.

1578 Rao Ratan, built Ratanpur, his son Mádhú Sinh receives *Kotá* from Gopináth. [Jehángir, henceforward separation.
1652 Chatra Sa'l, took *Kalberga*, under A'urangzéb, killed with 12 princes in battle of Ujain.
1658 Bhao Sinh, received govt. of *Arangábád* under A'urangzéb.
1681 Anurad Sinh.
1718 Budh Sinh, supported Bahádur Shah, dispossessed by *Jypur Rája.*
1743 Omeda, regains Bundi, 1749, with Holkar's aid, retires 1771, dies
1770 Ajít Sinh, *Jugráj*, murders Rána of Mewar. [1804.
Rao Ráj Bishen Sinh, minor, protects Col. Monson's flight.
1821 Rám Sinh.

Kotah Branch.

1579 Madhu Sinh, son of Rao Ratan, see above.
1630 Mokund Sinh.
1657 Jagat Sinh.
1669 Keswar Sinh.
1685 Rám Sinh.

1707 Bhim Sinh, entitled Mahárão.
1719 Arjun.
1723 Durjan Sál, without issue, Zalim Sinh, born 1740.
Ajit, grandson of Bishen Sinh.
Chatr Sál, succeeded by his brother.
1765 Gomán Sinh,—Zalim Sinh, *Foujdar.*
1770 Omeda Sinh, ,, *Regent.*
1819 Kiswar Sinh, Madhu Sinh, do.

Table XXV. Rájas *of* Malwa, *Capitals Ujjayana, and Mandór.*

This line is taken from Abul Fazl, and is supposed to have been furnished from Jain authorities: it agrees nearly with appendix to Agní Purána, (Wilford.)

In early ages Mahahmah founded a fire Temple, disapproved by the Buddhists, but restored by

B. C. 840 Dhanjí, (Dhananjaya, a name of Arjun,) about 785 before Vicramaditya, (see Anjana, Burmese list?)
760 Jítchandra.
670 Salivâhana.
680 Nirvahana.
580 Putra Rajas, or Vánsávalis, without issue.
400 Aditya Punwar, elected by nobles, (cot. Sapor, A. D. 191. W.)
390 Birma or Brahma Rája, reigned in Vidharbanagar.
360 Atibrahma, at Ujjain, defeated in the north.
271 Sadhroshana, (Sadásva-Séna*.)
191 Heymert, Harsha Mégha, killed in battle (misplaced, Wd.)
91 Gundrup, Gardabharupa, Bahram-gor? of Wilford.
56 Vicramaditya (3rd of Wilford. A. D. 441 Yesdejird?) Tuár tr.
A. D. 44 Chandrasén, possessed himself of all Hindustan.
135 Karaksén, Surya Séna, W. 676.
215 Chaturkot, (Sactisinha succeeded, W.)
216 Kanaksén, (see *Saurashtra* which he conquered? 144. T.)
302 Chandrapál.
402 Mahendrapal.
409 Karmchandra.
410 Vijyananda, adopted a successor (his son being an infant) Sindula, W.
470 Munja, killed in the Dekhan, (reigned A.D. 993 according to Tod.)
483 Bhoja, (S. 540,) by Tod. 567 A. D.† Kalidás flourished.
583 Jayachandra, put aside in favor of
593 Jítpál, of the Tenore (Tuár) caste (Chaitra Chandra, *Bavishya P.*)
598 Rána Rája.
603 Rána Baju.
604 Rána Jalu.
620 Rána Chandra.
654 Rána Bahádur.
659 Rána Bakhtmal.
664 Ráy Suhenpál.
669 Ráy Keyretpál.
674 Ráy Anangapál, (rebuilt and peopled Delhi, 791, T.)
734 Kunwerpál.
735 Rája Jagdeva, of the Chohán tribe.
745 Jagannath.
755 Hara deva.
770 Vásu deva.

* Vásudeva of Wilford, Basdeo, Fer. A. D. 390, father-in-law of Bahram, (see Canouj.)

† The other two Rájas Bhoja, Tod fixes in 665 (from Jain MSS.) and 1035, the father of Udayati.

786 Suradeva.
801 Dharmadeva.
815 Bhaldeva.
825 Nanakdeva.
834 Keyratdeva.
845 Pithoura.
866 Maldeva, conquered by Shekh Shah, father of Ala-ud-din.
Shekh Shah, from *Ghazni*.
1037 Dharma Rája Soud, Vizir during minority of
1057 Alla-ud-din, who put him to death.
Kemal-ud-dín, murdered by
1069 Jítpál Chohan, (Jaya Sinh of Delhi and Lahore? 977,) a descendant of Manikya Rai?
1089 Harachandra.
1109 Keyratchand.
1111 Oogersein.
1124 Surajnanda.
1136 Tippersein, or Beersén, dispossessed by
1146 Jelal-ud-dín, an Afghán.
1168 A'lam Sháh, killed in battle by
1192 Keraksén, son of Beersén, emigrated to *Kámrup*, married the king's daughter, succeeded to the kingdom, and regained Malwa.

1200 Narbahen, { Udayáditya deva, Naravarma deva, Yasóvarma deva, Jayavarma deva, Lakhan, } A. D. 1137. 1143. { Ujjain inscription.

1220 Bírsal.
1236 Purenmall.
1268 Haranand.
1330 Sakat Sinh, killed at the invasion of
1390 Baháder Sháh, king of Dakhan, killed at Delhi.

On the division of the Delhi monarchy, or Ghiásuddín's death,

1390 Diláwer Khán Ghorí, viceroy of Málwá, assumed sovereignty. (*See Musalman Dynasties.*)

Table XXVI. Saurásht̃ra (*Surát and Gujerát*). *Capital, Balabhipura. The Balabhi, Balhara, or Bala-rais Dynasty.*

The Jain chronicles of Jai-sinha, consulted by Col. Tod, *trace the ancestry of Keneksén, the founder of the Mewár family, up to Sumitra, the 56th descendant from Ráma, (vide the Surya-vansa list.) Solar worship prevailed, afterwards the Jain.*

A. D. 0? Maharitu, follows Sumitra, T. *Names according to Grants dug up in Gujerát,* Wathen.
Antarita,
Achilséna, *Senapati,* { Bhatárca, A. D. 144-190. Dharaséna.
144 Kanakseña, emigrates to Saurásht̃ra. *Maharájá.* Dronasinha.
Dhruvaséna, I.
Mahá Madan Sén, Dharapatta.
Sudentu. Grihasena.
318 Vijya, or Ajyasena, founded the Balabhí era, T.* } Sri'-dhara Se'na, 319. Siláditya, I.

* This and the *Srí Dharasena* of the adjoining list, fixed upon as the founders of the *Balabhi* era or *samvat*, may probably be the *Suraca* of the *Puránas*, mentioned as a Vicramáditya to mount the throne An. Kal. Yug. 3290, or A. D. 191 or 291, (As. Rs. ix. 135, 203,) Wilford. Many legends related by him of the Aditya, belonging to this dynasty.

	Padmáditya,	Charagriha, I.
	Siváditya, (466 Gardha-bhe-la? of Jain MSS.)	Srídharasena, II.
	Haráditya,	Dhruvaséna, II.
	Suryáditya,	Srídharaséna, III.
	Somáditya,	Siladitya, II.
		(3 names obliterated.)
		Charagriha, II.
523	Siláditya, killed and *Balabhi* destroyed by the Parthians, 524.	523 Siláditya, III.
		559 Siláditya Musalli, IV.

*Origin of Gehlote, Grahalote, or Sésodia tribe of Surya-vansis.**

Kaiswa, Goha, or Grahâditya, posthumous son of Siláditya, [born in *Bhandér* forest.
Nagáditya, of *Bhandér*.
Bhagáditya.
Devâditya.
Assaditya, founded *A'spur* in Mewár.
Khalbhoja.
Grahâditya, (others make Nagáditya, father of
713 Buph, or Bappa, seized *Chitor*, from *Mori* tribe, A. D. 727, and founded the Gohila or Gehlote dynasty of *Mewár*.

Names inscribed on *A'spur* marble, T.

(Continued in Table XXVIII.)

Table XXVII. Gujerát. *Capital* Patan. *The Anhulwára Dynasty, a restoration of the dynasty of the Balháras.*

[Ayín Akberi list collated with that of the Agní Purána, of Wilford.]

S.	A. D.	
	696	Saila-deva, living in retirement at *Ujjain*, found and educated.
802	745	Banarája, son of Samanta Sinh, (Chohan;) who founded *Anhulpur*, (*Nerwaleh or Patan*,) called after Anala Chohán, A. A.
	806	Jogarája,
	841	Bhíma Rája, — Bhunda deva, Wd.
	866	Bheur,
	895	Behirsinh, — *from the Ayín Akberí.*
	920	Reshadat, — Rája-Aditya, W.
	935	Samanta, — daughter, married son of Delhi Raja: Bhunda, W.

Rájas of the Solankhi tribe.

910 W.	Mula Rája, usurped the throne.
1025	Chamund, invaded by Sultán Mahmúd, (Samanta, W.)
1038	Vallabba, (Beyser, or Bisela, Ay. Ak.) ancient line restored.
1039	Durlabba, (Dabisalima, F.) usurped the throne.
1050	Bhíma rája.
	Káladeva, (Karan, A. A.) Carna-rajendra, or Visaladeva, Wd. who became Paramount Sovereign of Delhi, (see p. 104.)
1094	Siddha, or Jayasinh, an usurper.
	Kumárapála, poisoned.
	Ajayapala, son of Jayasinha.

The Bhágéla tribe.

	Múla, (Lakhmul, A. A.) Lakhan-raya, W. without issue.
	Birdmula, *Beildeva*, } Baluca-mula, Wd. of Bhágéla tribe.
1209 W.	Bhíma Deva, or Bhala Bhima Deva, same as the last, Wd.
1250	Arjun deva,
1260	Saranga deva, — *Ay. Ak.*
1281	Karan, — Carna the *Gohilá*, fled to the Dakhan, when in the year
1309	Gujerát was annexed to Delhi by Ala-ud-dín.

* The Persian historians make Noshizad, son of Noshirvan, or Maha Banú, daughter of Yezdijird, the origin of the *Sesodia* race of Mewár, 531.

Table XXVIII. Ránas *of* Mewár. *Capitals Chitór, Udayapur.*

(Continued from Table XXVI.)

After the destruction of the *Balhára* monarchy of *Saurâshtra*, and two centuries' sojourn of the family in the Bhandér desert, Baph or Bappa conquered Chitôr, and founded a new dynasty in A. D. 727. The hereditary title was changed from *Gehlote* to *Aditya*.

	Wilson's list.	*Tod, from Aitpur inscription.*
750	Guhila, ...	1. Sri Gohadit, founder of Gohila *(Gehlote)* tribe.
	Bhoja, ...	2. Bhoja (Bhagaditya ?)
		3. Mahendra.
		4. Naga (Nágáditya.)
		5. Syela.
		6. Aprajit *(compare with Tab.* XXVI.)
		7. Mahendra.
	Kalabhoja, ..	8. Kalabhoja.
	Bhartribhata,	9. Khoman—invasion of *Chitôr* from *Cabul* 812, A. D.
	Samahâyika,	Mangal, expelled by chiefs.
	Khuman, ..	10. Bhirtripad, founded 13 principalities for his sons in *Málwá* and *Gujerát*.
		11. Singhjí, whose Ráni, Lskshmi, bore
	Allâta, ...	12. Sri Allat, whose daughter Haria deví was grandmother of
	Naravahana,	13. Nirvahana.
		14. Salvahana.
967	Saktivarma,	15. Saktikumar, resided at *Aitpur*, 967, or 1068 ? T.
	Suchivarma,	Umba Passa.
977	Naravarma,	Narvarma, cotemp. with Sabaktegín.
1027	Kirttivarma,	Yasuvarma, do. with Mahmúd. *Aitpur* destroyed.
	Vairi Sinh, (Vira Sinha deva of Canouj ? *See Bengal.)*	
	Vijaya Sinh.	
	Ari Sinh.	
	Vikrama Sinh.	
	Sámanta Sinh, 1209, W.?	
	Kumara Sinh.	
	Mathana Sinh.	
	Padma Sinh.	
	Jaitra Sinh.	
	Tej Sinh.	
1165?	Samara Sinh, (Samarsi, T.) born 1149; marries Prithi Raí's daughter.	
1192	Kerna, or Karan, his son—	
1200	Rahup,—attacked by Shemsuddín, 1200.	
	Nine princes, occupying 50 years, engaged in crusades, to recover Gayá from the infidels, (Buddhists,) T.	
	Bhîmsi, recovers *Chitôr*.	
1274	Lakshman Sinh, (Lakumsi, T.) married Ceylon princess.	
1289	(Ramdeo of Ferishta.) *Chitôr* sacked by Allauddin, (1305, F.	
	Ajaya Sinh, (Ajaysi, T.) resided at *Kailwarra*.	
1300	Hami'ra, son of Ursi, recovered *Chitôr*.	
1364	Khait Sinh, (Khaitsi, T.) captured *Ajmir*.	
1372	Laxa Rána, (Lakha Rána, T.) rebuilds temples. Expedition to *Gayá*.	
1397	Mokuljí, supplants rightful heir Chonda.	
1418	Khumbo, (Kumbho, T. Gownho, A. A.) defeats Mahmúd of *Málwá*; pillar raised in commemoration, 1439.	
1468	Oda, murders his father, and is killed by lightning.	
1473	Raemal, repels invasion of Delhi monarch Lodi.	
1508	Sanga, Singram, or Sinka, the *Kalas* or pinnacle of *Mewár* glory, successfully resists Baber at *Biána*, 1526.	
1529	Ratna, fell in duel with Bundi Raja.	
1532	Bikramajit, his brother. 2nd sack of *Chitôr* by Bahádur of *Gujerat*; recovered by Hamáyun.	

Banbír, the bastard, raised to throne by Rájputs.
1540 Udaya Sinh, (Oody Sing,) 3rd sack of *Chitór*, 1580, by Akber.
1583 Pertáp, *(Rana.)* reverses at *Udípur* and *Kumalnír*.
1596 Amera, (Umra,) succeeds, recovers the ruined capital; defeats Abdulla Jan. 1610; makes peace with Jehángír.
1620 Kerna, (Kurn,) last independent Rája; embellished *Udípur*.
1627 Jagat Sinh, tributary to Sháh Jehán; peaceful reign.
1653 Raj Sinh, bunded Lake *Rájsamundra*.
1680 Jay Sinh, forms the lake *Jay-samund*.
1699 Amera, II. triple alliance with *Márwár* and *Ambér*, S. 1756.
1715 Sangrám Sinh; the *jezeya* tax abolished.
1733 Jagat Sinh, II. pays chouth to Mahrattas.
1751 Pertáp, II.
1754 Raj Sinh, II. country desolated by Marháttas.
1761 Arsi, his uncle. Zalim Sinh's rise.
1771 Hamira, a minor.
1777 Bhím Sinh, his brother. Holkar and Sindia overrun *Mewár*. Marriage feud of *Jypur* and *Jodhpur*. Kishna Kumár poisoned, and the race of Bappa Ráwal extinguished, all but
1828 Jewan (Javan) Sinh, the only surviving son.

Table XXIX. Rahtore Dynasty *of* Kanouj, *afterwards continued in* Ma'rwa'r, *or* Jodhpur.

From Tod's *genealogical rolls of the Rahtores, preserved by the Jains. vol.* ii. 5, 6,7.

A. D. (After the usual Theogony.)

300? Yavanasva, prince of *Parlipur?* supposed of Indo-Scythic origin.
390 Basdeo, *(Vasadeva*,)* revives Canouj dynasty; his daughter marries Bahram Sassan, of Persia. } Ferishta.
450 Ramdeo, fixed in Márwár—tributary to Feroz Sassan. }
469 Nayana Pa'la, conquers Ajipála of *Canouj*—hence called *Káma dhvaja*.
Padárat or Bharata, king of *Canouj*.
Punja, his son.
570? Dherma Bhumbo, his descendants called Dhanesra Camdhaj, (for 21 generations bore the name of Rao, afterwards Rája.)
Aji Chandra.

	From inscriptions†.	*From coins, old Series.*
		Aparajitadhajaparakrama.
Udaya-chandra.		A'patirurha.
Nirpati.		Kragiptaparagupta?
Kenekse'na, see Mál- [wá 400?	Gupta,	Sri Vikrama.
	Ghatotkacha,	Chandragupta.
Sehesra-sála.	Chandragupta,	Samudragupta.
Mégháséna.	Samudragupta,	Kumáragupta.
Virabhadra.	 a son.	Vikrama Narèndragupta.
Deosen.		Sasigupta?
Vímalasena.		Asvamèdhaparákrama.
Dánasen.	700? Yasovigraha or Sri-	*New Series.*
Mokunda.	1072 Mahichandra. [pála.	
Bhádu,	1096 Chandra deva, conq.	Mahípála deva.
1016 Kora or Chandpál, F.	1120 Madana Pála, [Canouj.	Kumárapála deva.
Rájsen.	1144 Govinda Chandra,	Govinda Chandra.
Tripála,	1168 Vijaya Chandra,	Jadjèya deva.
Sri Punja.	~~1169~~ Jaya Chandra,	Ajaya deva.
(Vira Sinha, *see Bengal.*	died, 1193.	

712 (Yass varman, *see p.* 102.
900 (Sáhasanka, *see Vis Prak.*
Vijayachandra.
1169 Jaya Chandra, (Dal Pangla.)

* Wilford names this prince *Sadápála*, or Sadasvapala. As. Res. ix. 211.
† See Journal As. Soc. III. 341.

Table XXX. Ma'rwár *or* Jodhpur. *Continuation of ditto.*

1210 Sivaji, grandson of Jayachandra, settled in the desert, *Khér.*
Ashthama, (Asothama T.)
Doohar, T. Dula Rai, W. made attempt on *Kanouj* and *Mandór.*
Raipál.
Kanhul.
Jalhun.
Chado.
Theedo.
Siluk or Silko, (origin of the *Silkáwats* or *Bhomeàs.*)
Bíramdeva.
1381 Chonda, assaulted *Mandór*, and made it his capital.
1408 Rinmal, of *Gohila* mother, made pilgrimage to Gaya.
1427 Rao Joda and 23 brothers, had separate fiefs.
1458 founded *Jodhpur*, and removed from *Mandôr.*
1488 Rao Sújoh, or Surajmal; rape of Rahtore virgins by Patháns.
1515 Rao Ganga.
1531 Rao Maldeo, becomes chief Rája of Rájputs; fortifies capital.
1568 sends his son as hostage to Akber; marriage alliance.
1583 Udaya Sinh; Chandra Sinh, upheld by clans, installed by Akber.
1594 Soor Sinh; named Siwaí Rája, a general in Mogul armies.
1619 Raja Gaj Sinh, slain in *Gujerát.*
1637 Jeswant Sinh, died in *Cabul.*
1680 Ajit Sinh, posthumous. Rahtore conflict at Delhi, 4th July, 1679, (7th Sravan, 1716,) 30 years' war against empire. Murdered by his son
1724 Abhay Sinh; entitled Maháraja Rájeswar, 1728.
1749 Rám Sinh, son, defeated by his uncle
1749 Bakht Sinh, who was poisoned in 1752.
1752 Vijaya Sinh, (Beejy Sing,) disputed succession with Ram Sinh.
1793 Bhim Sinh, usurps throne on his grandfather's death, by defeat of Zalim Sinh.
1803 Man Sinh. Feud for Kishna Kumárí, the *Udipur* princess.

Table XXXI. The Bikane'r Ráj, *a scion of* Jodhpur.

1458 Bíka, son of Joda, settled in the *Jit* country.
1494 Nunkarna.
1512 Jaet.
1546 Kalián Sinh.
1573 Ráy Sinh.
1631 Karna Sinh.
1673 Anop Sinh.
1708 Sarup Sinh.
Suján Sinh.
1736 Zuráwar Sinh.
1745 Gaj Sinh.
1786 Raj Sinh, poisoned in 13 days by
1788 Surat Sinh, regent, who usurped the throne.
1799 ——— vanquished Surtan Sinh and Ajib Sinh.
1804 ——— annexed Bhatner to his dominion.

Table XXXII. Ránas *of* Amber *or* Dhund'hár. *Capital Jaypur.*

The Cuchwáha race of Rájputs claims descent from Cush, *second son of* Ra'ma, *king of Ayodhya, who migrated and built the fort of Rotás, on the Sôn.*

A. D. 294 Rája Nala, founded *Narwar* or *Nishida.*
Thirty-two princes—having the affix, *Pála.*
965 Sura Sinh.
966 Dhola (Dula) Rai, expelled from *Narwar*, founded *Dhund'hár* dynasty.
Kankul.
Maidul Rao, took *Amber* from the Meenas.

Hundeo.
Kuntal.
1185 PUJANDEVA, (Pajun,) married daughter of Prithi Rája.
Malési.
Bijal.
Rájdeo (Sahirdeva? of *Narwar*, defeated by Mahmud, II. 1251, F.)
Kílan.
Kontal.
Junsi.
Udayakarna—his son Baloji obtained *Amritsir*, called *Shekhávat* from his grandson Shekhjí.
Nara Sinh.
Banbir.
Udhárao.
Chandrasén.
Prithi Ráj, pilgrimage to *Dewal* on the Indus: murdered by Bhíma, his son.
Aiskarn.
1550? Baharmal, (Puranmal, W.) paid homage to Baber.
1586? Bhagwán Dás, Akber's general, welded his daughter to Jehangir.
1592 MAN SINH, ditto, governor of Bengal—Dakhan—Cabul.
1615 Bhao Sinh, died of drinking.
1621 Mahá Sinh, ditto.
1625? JAYA SINH, Mirza Rája, poisoned by his son Kerat.
Rám Sinh, reduced to mansab of 4000.
Bishen Sinh, ditto..... 3000.
1698 SIWAI JAY SINH, founded *Jaypur*, published *Zij Mahomedsháhí*
1742 Iswari Sinh.
1760 Madhu Sinh.
1778 Prithi Sinh, II. minor.
1778 Pertáp Sinh.
1803 Jagat Sinh, an effeminate prince, died without issue.
1818 Jay Sinh, III. posthumous, believed supposititious.

TABLE XXXIII. RAOS *of* JESALME'R.

Dynasty of the BHATTIS, *a branch of the Yadu race of the Chandra Vansa*, TOD.

Nába, fled from *Dwarica* to *Marusthalí—(Bháyavat.)*
Prithibáhu—Khíra—Jud-bhán, (from Bhatti chroniclers.)
Báhu-bal, espoused daughter of Vijaya Sinh, *Malwa*.
Báhu, killed by a fall from his horse.
Súbáhu, poisoned by his wife, daughter of *Ajmír* Rája Mund.
Rijh married daughter of Ber Sinh of *Málwá*; invasion of Ferid Sháh.
B. C. 94? Rája Gaja, invaded Kandrupkél, in *Cashmír*.
A. D. 15? Salbahan, 15 sons, all Rájas, conquered Panjáb, expelled from Cábul.
Báland, invaded by *Turks*—his grandson Chakito, source of Chakit tribe.
Kullur, 8 sons, all became Musalmans.
Jinj, 7 ditto.
BHATTI, court at *Lahore*, gave name to family.
Mangal Rao, expelled by king of *Ghazni*—settled in *Mér*.
Majam Rao, his son—
730 Kehur, invaded by the Barahas, 787, A. D. 731.
733 Tanno, erected Bíjnôt.
813 Bíji Rae, continual feuds with the Langas, till 1474. Title Rao, exchanged for Rawul.
Deoraj, excavated several lakes, one at Tunnote.
Munda.
1008 Bachera, tributary to Anandapál of Delhi; invaded by Mahmúd.
1043 Dusaj.

Bhojdeo conspired against and killed by his uncle
1155 Jesal, slain in defending *Lodorva*. Removed capital to *Jesalmér*.
1167 Salivahan, II. throne usurped by his son, Bíjil.
1200 Kailun, elder brother, repelled the Khán of *Baloch*.
1218 Chachik Deo, extirpated Chunna Rajputs.
1250 Karan, repelled Mozaffer Khán.
1270 Lakhan Sinh, an idiot, replaced by his son
1275 Púnpál, dethroned by nobles.
1275 Jaetsi, recalled from *Gujerát*—defended fort for 8 years.
1293 Mulráj, III. great sack of *Jesalmér* by Mabúl Khán, 1294.
Dúdú, elected Rawul, second sack and immolation.
1306 Gursi, re-establishes *Jesalmér*.
Kéhar, adopted; feuds.
Rao Kailan, or Kerore, conquered to the Indus—lived to 80.
Chachik Deo, fixed capital at Marote; continued feuds.
1473 Bersi, conquest of *Multán* by Báber.
Sabal Sinh, *Jesalmér* becomes a fief of empire, under Rawuls Jait, Nunkarn, Bhím, Manohar Das; conversion of Bhattis.
Umra Sinh, predatory incursions.
1701 Jeswant, alliance with Mewár—end of Bhatti chronicle.
1722 Akhi Sinh, Sarúp Sinh minister potential.
1761 Mulrája, ditto.
1820 Gaj Sinh, ditto, under British protection.

Table XXXIV. Orissa, Or-Desa, *or* Atkala-Desa, *hod. Cuttack.*

From the Vansavali, and Rája Charitra, in the Uria language, preserved in the temple of Jagannáth, a record supposed to have been commenced in the 12*th century.—Stirling's Account of Cuttack. As. Res.* xv. 257.

After the usual detail of the Mythology, and early kings of India, down to Vicramáditya,

A. D. 142 Bato Kesari.
193 Tirbhoban deo.
236 Nirmal deo.
281 Bhíma deva.
318 Subhan deva. Rakta Bahu invades *Jagannáth by sea*, destroyed by an inundation of the sea, that also formed the Chilka lake.
Indra deva, was captured and displaced by the Yavanas, who reigned for 146 years.

Kesari-vansa restored.

473 Jajati (Yayáti) Kesari, capital *Jajepur*.
Suraj Kesari.
Ananta Kesari.
617 Lálat Indra Kesari, built the *Bhuvaneswar* temple, 657.
32 reigns, extending 455 years. Cuttack built, 989.

Ganga-vansa.

1131 Churang, Saranga deva, or Chor Ganga, invaded Orissa.
1151 Gangeswara deva, extended dominions.
1174 Ananga Bhím Deo, ascended Gajapati throne; endowed *Jagannáth*; struck coin; title Ráwat Rái.
1201 Rájeswara deo.
1236 Ra'ja Narsinh Deo, built *Kanárak* (black pagoda) 1277.
5 *Nara Sinhas and* 6 *Bhánus, called the Suraj-vansa Rájas.*
1451 Kapil Indra deo, adopted by the last Bhánu, assisted Telinga Rája against Musalmans, 1457.
1471 (Himber? Rai of Uria, according to Ferishta.)
1478 Pursottem deo, conquers *Conjeveram*.
1503 Pertáb Rudra deo, left 32 sons, all murdered by
1524 Govind deo, his minister.
1531 Pertáb Chakra deo, last of the dynasty.

1539 Narsinha Jenna, deposed by
1550 Telinga Mukund deo, (Harichandan,) invaded, and sovereignty of Orissa overthrown, by King of Bengal, 1558.

Khurda Rájas; Bhuí-vansa, or Zemindárí race.

1580 Ramchandra deo, titular Rája under Akber.
1609 Pursottem deo. Afghan incursions.
1630 Narsinh deo.
1655 Gangadhar deo.
1656 Balbhadder deo.
1664 Mukund deo.
1692 Dirb Sinh deo.
1715 Harikishen deo.
1720 Gopináth deo.
1727 Ramchandra deo. Boundary much reduced.
1743 Birkishore deo. Marhatta depredations.
1786 Dirb Sinh deo, attached to *Nágpur* 1755-6.
1798 Mukund deo, deposed by the English, 1804.

Table XXXV. Rájas *of* Ne'pál.

The mythology of Népal commences, like that of Cashmír, with the desiccation of the valley, for ages full of water, by a Muni called Naimuni, (whence the name of the country Naipála,) whose descendants swayed the sceptre for near 500 *years.—Kirkpatrick's Nipál.*

B. C. 3803 Bhurimahágah, (adjusted back at 18 years per reign, B. C. 844?)
3795 Jayagupta.
3722 Permagupta.
3631 Sri Harkh.
3564 Bhimagupta.
3526 Munigupta.
3489 Bishengupta.
3423 Jayagupta, II. overcome by Rajputs of the Terai, near Janakpur, B. C. 700?
3211 Bal Sinha, descendant of Mahipa Gopála.
3302 Jaya Sinha.
3281 Bhuwani Sinha, overcome by the

Kerrát tribe of eastern mountaineers.

3240 Yellang, adjusted date B. C. 646?
3150 Daskham.
3113 Balánchа.
3081 Kingli.
3040 Hananter.
2990 Tuskhah.
2949 Srupast.
2910 Parb.
2854 Jety dastrí.
2794 Panchem.
2723 King-king-king.
2667 Súnand.
2627 Thúmú.
2558 Jaigri.
2498 Jenneo.
2425 Suenkeh.
2365 Thúr.
2294 Thamu.
2211 Barmah.
2138 Gunjeh.
—— Kashkún.
2065 Teshú.
2019 Sungmía.
1950 Jusha.
1887 Gontho.
1813 Khimbhúm.
1739 Galijang, displaced by Khetris of the

Surya-vansi race.

1658 Nevesit, (adjusted date of conquest, B.C. 178.)
1608 Matta Rátio.
1517 Kaikvarma.
1441 Pasupush deva (founded Paspatnáth.)
1385 Bhoskar varma, a great conqueror.
1311 Bhumi varma.
1270 Chandra varma.
1249 Jaya varma.
1187 Vrisha varma.

1130 Sarva varma.
1081 Pathi (Prithi) varma.
1025 Jist (Jayertha) varma.
977 Kuber (Kuvera) varma.
901 Hari varma.
824 Siddhi varma.
763 Haridatta varma, (founded Sapae Narayan temple.)
724 Vasu datta verma.
691 Sripatri.
688 Siva vriddi.
611 Vasanta deva.
550 Deva.
493 Brikh (Vriksha) deva.
436 Sankara deva.
386 Brahma deva.
335 Mán deva, erected *Sambhunáth mundil.*
297 Mahe deva.
247 Vasanta deva.
190 Udaya deva.
143 Mán deva, II. 3 years drought.
98 Sukam.
48 Siva deva.
6 Narendra deva.
A. D. 27 Bhima deva, varma, displaced by the

Ahirs, or original Sovereigns.

43 Bishen gupta.
117 Krishna gupta.
178 Bhûmi gupta, expelled by

The Neverit Dynasty, restored.

218 Siva deva varma, (adjusted date, A. D. 470.)
259 Anghú varma.
301 Kirtu varma.
319 Bhima Arjuna deva.
358 Nanda deva.
371 Siva deva.
387 Narendra deva.
424 Bala deva.
441 Sankara deva.
453 Bhima Arjuna deva, II.
469 Jaya deva.
488 Sri bala deva.
504 Kondara deva.
531 Jaya deva, II.
574 Bala deva, III.
585 Balanjun deva.
622 RAGHABA DEVA, adjusted date, A.D. 880†.
985 Sikar deva*.
773 Soho deva.
807 Vikrama deva.
808 Narendra deva.
810 Ganakáma deva*.
895 Udaya deva.
901 Narbhay deva.
908 Bhoj deva bhadra.
917 Lakshmi kám deva datta.
938 Jaya deva, reduced *Patan.*
958 Udaya deva.
966 Bala deva.
977 Padiem deva.
984 Nag Arjuna.
987 Sankar deva.
1004 Bam deva.
1006 Sri Harak deva.
1022 Siva deva.
1050 Indra deva.
1062 Mán deva.
1067 Narendra deva.
1073 Rudra deva*.
1153 Amrita deva, (a great dearth.)
1157 Súmesar deva.
1164 Baz kám deva.
1195 Anya mall—a famine.
1244 Obhaya mall, ditto, and earthquakes.
1246 Jaya deva.

1280 Anwanta mall deva. Kásias and Tirhut families settled in Nipal, *Sam.* 1344. A. D. 1287.
Jayananda deva.
Jaya sinha mall.
Jaya Raera mall, daughter married Hari Chandra, Rája of Benares —his daughter Raj Lachmí succeeded, but was deposed by
1323 Jaya deva, who was dispossessed of the throne by

† This is exactly the first year of the *Newár* era. He, it is said, introduced the *Samvat* into Nepal, which may apply to this, and not to the era of Vicramáditya. (With one or two exceptions, marked*, these reigns are of natural lengths, and require no adjustment.)

1323 Hara sinha deva, raja of *Simroun*, who was expelled from his own dominions by the Patan sovereign of Delhi. *(See below.)*
Belal Sinha, capital *Bhatgoan.*
Sri deva mall.
Náya mall.
Asoka mall.
Jestilí mall.
Jait mall.

1600? Jaya Eksha Mall, (or Jye Kush Mull,) divided *Patan, Khatmandu, Banepa,* and *Bhatgaon* between his daughter and three sons.

Bhatgáon.		*Banepa.*		*Patan.*	
Raya Malla.		Ran Malla.		a daughter.	
Bhu Bhin malla.		*Khatmandu.*		1654	Siddhi Nara Sinha.
Besson malla.		Ratna malla.		1685	Nirman Indra malla.
1669-79	Jaya Chakra mall.	1632	Jaya Prakás malla.		
	Tríloka malla?	1656	Pratáp malla.	1689	Yoga Narendra malla.
	Jagat Johi malla.	1662	Jaya Yoga Prakás malla.	1695	Mahipat Indra mall.
	Jay Jeta mitra malla.	1695	Jaya Prakás malla.	1696	Jaya vira mahendra.
1695	Bhupati Indra malla.	1701	Bhaskara malla.	1706	Jaya Indra malla deva.
		1715	Mahendra malla.		
1721	Ranjít malla, formed alliance with Gurkhas, which ended in his subversion, and finally that of all Nèpál.	1722	Jaya Jagat Jaya malla.	1715	Hridiah Narasinha.
		1716	Kishi nirmal deva.		
		1724 to 1753	Jaya Yoga Prakás mall, from *Patan*.	1722	Jaya Zughir yoga malla deva.
				1729-31	Jaya Vishnu malla.
				1742	Jaya Yoga Prakás malla deva.
				1749-5	Jaya Vishnu malla Agani.

Gurkhali Dynasty, descended from the Udayapur Rájpúts, occupied Kemaon and Noakót, for 6 or 8 generations, prior to conquest of Nèpál.

1768 Príthinarayan Sáh.
1771 Pertáb Sinha Sáh deva.
1775 Ran Behádur, (Behádur Sáh regent,) deposed by nobles, 1800.
1800 Girwan Yudh Vikrama Sáh deva.
1804 Ran Behádur, returns from Benares, deposed and assassinated.
1805 Girvan Yudh Vikrama Sáh deva, again.
1816 Rajendra Vikrama Sáh deva.

The *Khatmandu* and *Patan* names, and all the dates from 1632 downwards, are confirmed by Nipalese coins in my possession, collected by Dr. Bramley.

Table XXXVI. Rájas *of* Samangarha, *or* Simroun, *in the Tarái, south of Nèpál.*

	From Kirkpatrick.	*From Hodgson's List, Journ. As. Soc.* IV. 123.
A. D. 844	Nána deva.	Nányupa deva, founded Simroun, A. D. 1097.
	Kanak deva.	
	Narsinha deva.	Ganga deva.
	Ráma Sinha deva.	Nara Sinha deva.
	Bhad Sinha deva.	Ráma Sinha deva.
	Karm Sinha deva.	Sakti Sinha deva.
1323	Hara Sinha deva.	Hara Sinha deva, compelled to abandon his capital and take refuge in the hills, when *Simroun* was destroyed by Toghlak Sháh, in 1323 A. D. *See above* for his connection with the Ráj of *Nèpál.*

Table XXXVII. Rájas *of* Bengal, *capitals, Kanouj?—Gaur.*

Abul Fazl enumerates three Dynasties anterior to the family of Bhupála, which last is identified by inscriptions found at Benares, Monghir, Dinajpur, &c. viz.

The family of Bhugrut (Bhagiratha), Xatriya—24 princes, reigned 2418 years.
The family of Bhojgorya, Kaith—9 princes, reigned 250 years.
The family of Udsoor (Adisur), Kaith—11 princes, reigned 714 years.
Then follows the family of Bhupál, to whose 10 reigns 689 years are allotted, which is evidently too much; the succession of names differs also somewhat from those of the inscriptions.

From Abul Fazl.	*Monghir plate*.*	*Dinájpur copper-plate.*
Bhopála.	Gopála.	Locapála.
1027 Dhirpála.	Dhermapála.	Dhermapála.
1050 Deopála.	Devapála.	Jayapála.
Bhupatipála.	*Budal plate.*	Devapála.
Dhanpatpála.	Rájapála,	Náráyanpála?
Bijjenpála.	Súrapála.	(Two names illegible.)
Jayapála.	Náráyanpála.	Rájapála.
Rájapála.	*Sarnáth inscript.*	Vigrahapála.
Bhogpála.	Mahipála,	Mahipála, at Benares.
Jagadpála.	Sthirapála,	Nayapála.
	Vasantapála.	1027 Vigrahapála.
	1017 Kumarapála *(Fer.)*	

Vaidya Rájas of Bengal.

1063 Sukh Sen.
1066 Belal Sen, built the town of Gaur.
1116 Lakshman Sen.
1123 Mádhava Sen.
1133 Kesava Sen.
1151 Sura Sen.
1154 Náráyana—Noujeb, last rája of Abul Fazl's list.
Laxmana.
1200 Laxmaniya.
(See Mahomedan dynasties.)

Table XXXVIII. Rájas *of* Assam—*anciently* Kamrup.

The best authority is a Native History, (Assam Buranji,) by Huliram Dhaikiyál Phukan, of Gohátí. Beng. era 1236. *As. Jour.* 1830, *p.* 297; *also Mr. Scott's MS. Notes, arranged by Dr. McCosh.—Buchanan is not to be trusted prior to Rudra Sinha.*

After bringing down the genealogies to the *Xatriya* Dynasty of *Dravir* (Dharmapa'la, &c. who invited brahmans *from Gaur* to his court, north of the *Brahmaputra!)*

Brahmaputra Dynasty. 240 *years.*

Shusánku, or Arimatu, built fort of *Vidyagarh.*
Phainguya, an usurper of the race of Kumuteshvar.
Gujanke, former line restored.
Shukaranku.
Mriganku, without issue; died A. D. 1478.
Assam divided into 12 petty states.
1498 ——— invaded by Dulal Ghází, son of Hosein Sháh.
Musundár Ghází.
Sultán Ghiásuddín; after whom 12 states restored, of which *Nara, east of Saumar*, had been gradually rising into power, since the middle of the 13th century.

* The Monghir plate, dated 23 or 123 *Samvat*, evidently refers to the *Bhupála* dynasty, and not to the Vikramáditya era as was supposed by Wilkins.

Indravansa (Indu) Dynasty.

1230? Chu-kapha, became independent, and spread conquests, surnamed *Asama* (unequalled), whence *Assam.*
1268 Chu-toupha, son, defeated the Rája of *Cachár.*
1281 Chu-benpha.
1293 Chu-kangpha.
1332 Chu-khampha; valley invaded by Muhammed Sháh, 1337.
1364-9 Interregnum of five years; when the ministers installed
1369 Chu-taopha, a relation, conquered Chhutiyas.
1372 Chu-khámethepa, a tyrant, killed by his ministers.
1405-14 Interregnum of nine years.
1414 Chu-dangpha, conquered as far as the river Kurutoya.
1425 Chu-jángpha, his son.
1440 Chu-phúkpha, ditto.
1458 Chu-singpha, ditto.
1485 Chu-hangpha, ditto.
1491 Chu-simpha, a tyrant, put to death.
1497 Interregnum, and Hosein Sháh's invasion, 1498.
1506 Chu-humpha, a brother, various conquests.
1549 Chu-klunpha, his son, built *Gurgram.*
1563 Chu-khrunpha.
1615 Chu-chainpha; introduced reforms; protected Dharmanárain.
1640 Chu-rúmpha, a tyrant, dethroned.
1643 Chu-chinpha.
1647 Kuku-raikhoya Gohani, dethroned for his brother
1665? Chukum, or Jayadhwaja Sinha, adopted Hindu faith; defeated Aurangzeb's general?
1621* Chakradhwaja (or Brija) Sinha, built fort of *Goháti;* (Sámagrya deva, Mc. C.); repulsed Aurangzeb's general? called Chukum?
1665 Kodayaditya Sinha, attempted to convert the people.
1677 Parbattia Kunria.
1681 Lorarája; for some reigns confusion prevailed until
1683* Gadádhara Sinha; his son Kana set aside.
1689-1713* Rudra Sinha, built Rangpur and Jorhát; his coins first bear Bengálí inscriptions.
1715-21* Siva Sinha, established Hindu festivals.
1723-26* Phuléswarí, his wife, acquires sovereign rule.
1729-30* Pramathéswarí deví, ditto.
1732-36* Ambiká deví, ditto.
1738-43* Sarvvèswari deví, ditto.
1744* Pramatha Sinha, made equitable land settlement.
1751* Rajeswara Sinha, embellished *Rangpur,* allied with Manipur.
1771* Laxmi Sinha Narendra, younger son, raised and deposed by minister.
1779* Gaurinátha Sinha, his son.
1792* Bharata Sinha Mahámári, conquers Rangpur, and
1793* Sarvánanda Sinha, usurps power at *Baingmara.*
1796* Bharata Sinha, again attempts, but is killed.
Gourinátha Sinha, restored by British; died at *Jorhát.*
1808* Kamaleswara Sinha, or Kinnarám, not crowned.
Rája Chandrakanta Sinha Narendra, fled to Ava.
Purandhar Sinha, great grandson of Rajeswara Sinha, expelled by Burmese, and
Chandrakanta, restored, but deposed again, and
Yogeswar Sinha, raised by Assamese wife of Ava monarch, under Menghi Maha Theluah, the Burmese general and real governor.
1824 Burmese expelled by English.

1712* Date of Manipurí square coins.
1763* Persian coins of Rája Mír Sinh of *Rangpur.*
1780* Bengálí coins of Jayantea Rája.

* These dates are confirmed by coins in Marsden's Num. Or. and others in Captain Jenkin's collection.

TABLE XXXIX. RÁJAS *of* MANI'PUR, *Mièthiè, or Moglí. From the Miehouba or royal geneological roll, Capt.* PEMBERTON'S *MS.*

A. D.			A. D.		
35 ?	Pakhungba, reigned	140 yrs.	1437	Ninthoukhombo, reigned	35 yrs.
174	Khoí,	90	1472	Keyamba,	40
264	Tanuthingmang,	100	1512	Koeremba,	5
364	Koening gualba,	15	1517	Lamchaigmanba,	3
379	Pensíba,	15	1520	Nongyilphuba,	9
394	Kanu khangba,	15	1529	Kapomba,	17
411	Nanu khamba,	47	1546	Tangchomba,	4
428	Nanu phamba,	90	1550	Chullamba,	17
518	Samuerang,	50	1567	Mungyamba,	35
568	Kol Thuoba,	90	1602	Khakèmba,	55
663	Nanuthinghong,	100	1657	Khulchouba,	14
763	Khongtekcha,	10	1671	Paikhomba,	31
784	Kaereleha,	15	1702	Charáirongba,	12
799	Yaraba,	22	1714	Pamhaiba—Gharíbnawáz, or Garmúni rája, or Myanggnumba,	39
821	Ayangba,	89			
910	Ninglouchenng,	39			
949	Eipál lal Thaba,	24	1753	Khakhilalthába, or Oogat Sháh,	3
973	Yanglao kai phamba,	8			
981	Eerengba,	89	1756	Mingthoèkhomba—Bharat Sháh,	2
1070	Laiyamba,	56			
1126	Loitongba,	30	1758	Gourí Shám—Maramba,	6
1156	Monyoirelba,	14	1764	Chingthangkhomba, or Jaya Sinha, Nongnangkhomba,	2
1170	Eiwalthaba,	30			
1200	Thawálthába,	36			
1236	Chingtanglalthaba,	11	1766	Gouree Sham,	1
1247	Thing baisel homba,	5	1767	Jaya Sinha,	31
1252	Puralthaba,	16	1798	Robin chandra,	3
1268	Khumomba,	15	1801	Modu chandra,	5
1283	Moeramba,	24	1806	Charjit Sinha,	6
1307	Thangbilalthaba,	22	1812	Márjit Sinha, expelled by Barmas,	1819
1329	Kongyamba,	31			
1360	Telhueba,	19	1824	Gambhir Sinha, brother, regained possession.	
1399	Laizelba,	5			
1409	Púlseba,	24	1834	Kirti Sinha, a minor, son of do.	

TABLE XL. *The* NARAPATI, *or* SHOLAN DYNASTY *of* KARNÁTÁ, DRAVIRA, *and the southern portion of the peninsula. 27 Rájas, reigned 534 years.*

Contemporary with the Gajapati and Asvapati Dynasties; from a MS. translated by BUCHANAN.

A. D.					
266 ?	Utinga Sholan, reigned	32 yrs.		Arleana Cadamai Canda Sholan,	62 yrs.
	Culatunga Sholan,	18		Jayam Canda Sholan,	12
	Rájendra Sholan,	11		Kirimi Canda Sholan,	20
	Tiramadi Canda Sholan,	13		Tondaman Sholan,	12
	Carical Sholan,	21		Buddam Cattam Sholan,	45
	Arundavan Sholan,	13		Shomuman Sholan,	11
	Vomyara Sholan,	17		Ghingui Canda Sholan,	11
	Shávangana Sholan,	15		Sundra Pandia Sholan,	40
	Munalinda Sholan,	12		Pottápa Sholan,	24
	Mavanedi Canda Sholan,	15		Shingu Vullanda Sholan,	14
	Vakula Sholan,	14		Deva Sholan,	10
	Alaperinda Sholan,	8		Shayanahatti Sholan,	15
	Tiraveratu Sholan,	15		Vira Sholan,	30

800 ? Shayangara Sholan, 24 years; the MS. makes the final date, A. D. 288. After the overthrow of the *Narapati* dynasty, *Karnata* and *Dravira* seem to have been separated from the southern districts, in which the *Chera, Chola,* and *Pandava* lines were at first united under one sovereignty.

13 *Mahá Rájas of Mádura, Tanjore, and Coimbetore, reigned* 239 *years.*

	Udiamara, reigned.. 18 years.	
	Jeya deva, ... 19 ditto.	
	Lohita,..... 10 ditto.	During this dynasty, the palace of
	Ganga díra,..... 11 ditto.	*Mádura* is supposed to have been
	Vama deva,..... 13 ditto.	erected.
	Terupulinda, ... 34 ditto.	
	Pattáviran, ... 43 ditto.	
	Sri Devanátha, ... 38 ditto.	
	Malik Arjana,..... 7 ditto.	
	Adi Raer,..... 13 ditto.	
	Mahá sustra, ... 16 ditto.	
	Visuvesvara, ... 8 ditto.	
950?	Chindrabuti, ... 9 ditto.	

After which follow the *Belál* Rájas of the *Karnáta*, and the petty Polygár dynasties of *Mádura*, &c.

TABLE XLI. BELÁL RÁJAS *of the* KARNÁTA. *Capital Dwárasamudra. Nine Princes governed above the Ghâts* 98 *years, and afterwards below the Ghâts* 111 *years.* (BUCH. *Mysore*, iii. 112.)

A. D.	MACKENZIE'S MS.		BUCHANAN, iii. 474.	
984	Hayasala Belála ráya.		Rája Belála Ráya, reigned ..	18
1043	Vinádítya Belála.		Vira B. R.	11
1073	Yareyánga Belála.		Chinna B. R.	22
1114	Vishnu Verddhana Belála.		Deva B. R.	14
1145	Vijaya Narasinha Belála.	1016	Vishnu verti B. R.	28
1188	Vira Belála.		Hari B. R.	19
1233	Vira Narasinha deva.		Imadi B.R.	17
1249	Vira Someswara.		Visia B. R.	16
1268	Vira Narasinha, taken by the Mahomedans, and his capital destroyed in 1310-11.		Buca B. R.	22
			China Buca B. R.	8

TABLE XLII. ADEVA RÁJAS *of* TULUVA, ANDHRA, *or* TELINGÁNA. *Capital Woragalla or Warancal.*

19 *Adeva Rájas reigned* 370 *years,* (211 *years?*) *supposed to be the* 18 *princes of Andhra descent, prior to Pratápa Rudra.*

A. D.		
800?	Sri Ranga A. R., reigned	25 yrs.
	Vira Náráyana A. R.	23
	Wobala A. R.	21
	Siruvayanagada A. R.	22
	Pirungei Endia A. R.	15
	Canda Gopála A. R.	32
	Narasinha A. R.	13
	Cambuli A. R.	15
	Bacan A. R.	22
	Vira Narasinha A. R.	12
	Narasinha A. R.	8
	Duia A. R.	12
	Sri Pandia A. R.	9
	Vasu deva A. R.	12
	Siric Virindi A. R.	15
	Cutia deva, A. R.	14
	Rája visia Bujinga, ...	12
	Salica Náráyana A. R.	10
	Pritivadi Bacukera Sadicun, ...	87
1167	Uricandi Pratápa Rudra, 58 or 54, ended 1221.	
	Anna Pemma, ... 77 supposed subsequent to Mah. subjection.	

The *Mlechhas* (Muhamedans) followed, and Pratápa Rudra; whose officers, Hucca and Bucca, raised the Vijyanagar dynasty; the list of which in Buchanan, iii. 476, differs essentially from that given by inscriptions.

Table XLIII. Rájas *of* Chola, *(Chola-mandeloor, Coromandel;)*

Including the country now called the Carnatic below the Ghâts, hod. Tanjore. *Capitals (in Ptolemy's time), Arcot; then Wariur, near Trichinopoly; next, Kumbbahona, and lastly, Tanjore.* Wilson's Mackenzie MSS.

A. D.	
700-1000 ?	Kulottunga—others say 3000 B. C. or 500 A. D., or 1200 A. D.; [built temple at *Tangapur*, or *Tanjore.*
	Deva Chola.
	Sasisekhara.
	Siva linga.
918 ?	Vira chola.
1100 ?	Keri kala, persecutor of Rámánuja.
	Bhima.
886 ?	Rájarájendra, subdued various countries.
	Vira mártanda.
	Kirttivardhana.
	Vijaya.
	Kanaka.
	Sundara, killed a Brahman.
	Kalakala.
	Kalyána.
	Bhadra.
1407 ?	Pattira Chola? last according to some accounts,
	Kulottunga Chola—last according to others, married his daughter to 48th Pandyan prince, who succeeded
	An illegitimate son (Nanda?) founded the *Tonda Mandalam (Conjeveram)*—also annexed to *Pandya* kingdom.

Table XLIV. Rájas *of* Chera *or* Konga, *(comprehending Salem and Coimbetore.)*

The Kongadesa Rája kal enumerates 26 princes. Mackenzie's MSS.

Vira ráya.
Govinda ráya.
Krishna ráya.
Kalivallabha.
Govinda, II.
Chaturbhuja.
Kumára deva.
Trivikrama deva.
Kongani vermá.
Madhava vermá.
Hari varmá.
Vishnugopa.
Krishna varmá.
Dindikara.
Durvaniti.
Pushkara.
Trivikrama.
Bhúvikrama.
Kongani Mahádhirája.
Govinda, III.
Sivaga.
Prithiví Kongani Mahádhiráya.
Rája deva.
Malla deva.
Ganda deva.
Satya vrákya deva.

A. D. 894 Gauttama deva, subdued by the *Chola Rája*, from whose descendants it passed to the *Belál* râjas of *Maisur*, and thence to the *Vijayanagar* dominion.

Table XLV. Pandyan Dynasty *of* Mádura.

Tradition ascribes 74 princes, of whom 39 names are extant.

Kulottunga, 2000 B. C.?
Anantaguna.
Kálabhúshana.
Rájendra Pándya.
Rájeswara.
Gambhira.
Vansapradipaka.
Puruhutajit.
Pandya Vamsapátáká.
Sundareswara.
Padasekhara.
Varaguna, united *Chola* and *Tonda* to *Mádura.*
Rájendra.
Suguna.
Chitraratha.

Chitrabhushana.
Chitra dhvaja.
Chitra verma.
Chitrasèna.
Chitravikrama.
Udanta.
Rája Charámani.
Rája Sárdula.
Kulottunga.
Yodhana pravíra.
Rája Kunjara.
Rája Bhayankara.
Ugrasena.
Mahásena,
Satrunjaya.
Bhimaratha.
Bhimaparákrama.
Pratápa Mártanda.
Vikrama Kunjaka.
Yuddha Koláhala.
Atula Vikrama.
Atula Kirtti.
Kirttivibhúshana.
Vamsasekhara, founded the *Madura* college.
Vamsachurámani.

Náyak Dynasty—founded by Nágama nayak, an officer of Krishna ráya of Vijayanagar. 14 *princes.*

1530 Viswanáth.
Krishnapa.
Virapa.
Visvapa.
Kumara Krishnapa.
Kasturi Ranjapa.
Mutu Krishnapa.
Virapa; died 1623.
1623 Terumala, or Trimal, 1663.
1663 Muta virapa.
Chokanáth; died 1687.
1687 Krishna mutu Virapa.
1695 Vijaya ranga, under regency of *Mangamál.*
1731 Vijaya Kumára, do. of *Minaxi ráni.* Fort seized by Muhammedans, and *Mádura* became tributary to Nuwáb of Carnatic, and afterwards to the British.

Table XLVI. Rájas *of* Vijayanagar.

From history, inscriptions, and family genealogy, see As. Res. vol. xx. *The latter authority, in the usual manner, deduces a direct line from* Pandu, *of the lunar dynasty, imperfectly following the Pauranic lists to* Chandrabija, *the last of the Mágadha rájas; to whom succeeds,*

Marru.
Nanda.
Bhutanandi.
Nandili, who has two sons, Seshunandi, and
Yeshanandi, whose 14 sons, ruling over Bylemdesh, are dispersed by two invaders, Amitra and Durmitra; and seven fled to *Andhradesha*, or
A. D. Telingana, where
1034 Nanda, maharája, erected a kingdom, and founded *Nandapur* and *Warangol.*
1076 Chalik raja.
1118 Vijaya ra'ja; founded *Vijayanagar.*
1158 Vimala rao.
1182 Narasinha deva.
1249 Ráma deva.
1274 Bhúpa raya, died without issue.
1334 Bukka, son of a neighbouring rája, raised to the throne of the Dekhan by Vidyaranya, his *gúrú.*
1367 Harihara rao.
1391 Deva rao.
1414 Vijaya rao.
1424 Pundara deva rao, deposed by Sri Ranga raja of *Kaliandrúg.*
1450 Ráma chandra rao, son of Sri Ranga.

1473 Narasinha rao.
1490 Vira narasinha raja.
Achyuta rao.
1524 Krishna deva; extended his sway to *Gujerat*, &c.
Ráma raja, killed in invasion of Nizám Sháh, and Imád ul mulk.
1565 Sri Ranga rája.
Trimala raja.
Vira yangat pati.
Sri Ranga II.
Rámadeva rao.
Venkatapati rao.
Trimala rao.
Rámadeva rao.
Sri Ranga rao.
Venkatapati; invaded by the Moghuls and fled to *Chandragiri*.
Rama rao; recovered a portion of territory.
1693 Hari Dás.
1704 Chak Dás, his brother.
1721 Chima Dás.
1734 Ráma ráya.
Gopála rao, son of Chak Dás.
1741 Yankatapáti.
1756 Trimala rao.
Sultán Khán took the country in the name of Tipu; and with Vira Venkatapati Ráma raya, the dynasty became extinct, A. D. 1829.

Table XLVII. Rájas *of* Maisur, *(Maheswar or Mysore.)*

Their genealogy is traced from the Yadu line of Chandravansa. Mck. MSS.

A. D.
Betta Vadiyar.
Chamaraja Vadiyar, son of Yadu.
1530 Timmaraja Vadiyar, son of Betta.
Hiriya Chamarasa Vadiyar, his son.
Bettatha Chamarasa Vadiyar, do. who had three sons,
1 Timmarája Vadiyar.
2 Krishnarája Vadiyar.
3 Bola Chamarasa Vadiyar; had two wives, Viryammá and Demayammá.
1600 ? Rája Vadiyar, son of the former, took Seringapatam, 1610.
Bettada Chamarasa Vadiyar.
Devappa rája Vadiyar, } son of Demayammá.
Chama rája Vadiyar, }
Narasa rája Vadiyar, son of first wife of Rája Vadiyar.
Chamaraja Vadiyar, his son.
Imadi Rája Vadiyar, son of Rája Vadiyar's second wife.
1638 Kanthirao Narsa rája Vadiyar, son of Bettada, acquired great power. [Chinrayapatan inscript. Buch. Mysore.
1659 Doda Deva rája Vadiyar, son of Devappa, extended dominion N. W.
Chikka Deva rája Vadiyar, his son, collected family history.
1704 Kanthirao Narsa rája Vadiyar, his son.
1713 Krishna rája Vadiyar, do.
Chamaraja Vadiyar.
Imadi Krishna rája, son of Krishna.
Nanja rája Vadiyar, his son.
Chamaraja Vadiyar, dethroned by Hyder Alí; Mysore destroyed.
1796 Krishna rája Vadiyar, restored by the British.

Table XLVIII. Paligar Dynasty *of* Trichanapali.

Terumala Raya, of *Achita* tribe, in *Tennivelly*, founded dynasty.
Panchákhya.
Tondaka.

Navana Choládhipa.
Terumala Nripálachandra.
Navasauri.
Páchanara pála.
Námana.
Pachamahisu.
Kinkinipati.
Tondaka Nripati.
Tirumala Bhúpa.
Padmapta.
Raghunátha, an officer of Vijaya Rághava, of *Tanjore.*
Terumala ráya.
Sri Vijaya Raghunáth, conquered Chonda Khán.

Table XLIX. Valuguti Rájas *of* Venkatagiri, *or Káli malè.*

From the Mackenzie MSS.

Pátalmári vetál.
Damanaidu; aided in giving
Vanamnaidu. Pratápa Rudra the
Yaradaxanaidu. throne of Warangol.
Sinha manaidu.
Madan.
Vedagiri naidu.
Kumar madan.
Sinham naidu.
Pada sinham.
Chenna sinham.
Anupota; extended sway to Krishna river.
Sarva sinh.
Dharmanaidu.
Timmanaidu.
Chiti daxa.
Anupota.
Madan.
Sura.
Yachamanaid; founded *Valáguti* branch. 1804
Chenna Sinh, under Vijyanagar.
Nirván ray appa.

Kumara timma naidu.
Padakonda naidu.
Padakonda naidu II.
Chennapa naidu.
Venkatádri naidu; whence name of place.
Ráyápá.
Pennakondapa naidu.
Yachama.
A.D. Kasturi.
1600 Yacham naidu, conquered as far as the *Mádura* province.
Padayachem.
Kumár yachem.
Bengar yachem; murdered A. D. 1696, by Zulficárkhán.
Kumár yachem; died 1747.
Bengar yachem, and
Padayachem, 1776.
Kumar yachem, adopted.
Bengar yachem; ditto.

Table L. Indian Dynasties, *according to* Ferishta, *stated to be taken from Persian and Sanscrit authorities.*

[This list is useful for comparison with those already inserted.]

Mahraja; descended from Krishna; reigned in Oudh.
Line of Mahárájas reigned for 700 years.

B. C.		Feredon; first invasion of India, Málchand reigned in
1429		Kesvarája; invaded Ceylon with aid of Persia. [Málwa.
		Manérráya, built Manèr.
1209		Feroz-ra, conquered Panjáb.
1072		Suraja dynasty at Kanouj, where worship of sun intro-
786		Baraja. [duced.
		Keidar; tributary to Persia.
731	(died)	Sinkol; built *Laknauti* (Gaur) in Bengal. Persian invasion under Peiranweisa.
586	Maharáj,	Kachawa Rajputs of Amber established.
540		Keda raja, Rustam slain—Rohatray built *Rotas.*
497		Jaya chand, his minister—a famine.
437		Dehlu, built Delhi.
397		Porus, of Kemaon, usurped throne of Kanouj.
350		Porus II.; resisted Alexander's invasion.
330		Sinsar-chand (Sandracottus).
260		Jona, and his line, reigned tranquilly 90 years.

170 Kalian chand, a tyrant; kingdom of Kanouj dismembered.
56 Vikramajít, (died) reigned in *Málwá* and *Gujerát;* era established; anarchy and confusion succeeded.
A. D. 483? Rája Boga, (Bhoja,) of the *Tuár* tribe.
A. D. 330 Basdeo, (Vasudeva), revived Kanouj dynasty* ; cot. of Bahramgor, who married his daughter.
410 Rámdeo, of Rhatore race, fixed in *Márwár;* tributary to Feroz Sassa. Civil wars, took Kanouj and Bengal, married daughter of Sivaray of *Vijayanagar.*
500 Pratab Chand his general, of *Sesodia* tribe, refused tribute to No-
— Anand deva; reigned in *Málva*, built *Mandô* and *Ramgir.* [shirvan.
550? Maldeo; assumed throne of Delhi, and Kanouj empire divided.
— Hispál, father of
977 Jaipál, Rája of Láhore, invaded by Sabektagín and by Mahmúd.
— Anandpál succeeds, defeated by Mahmúd.
1009 Bachera (Vijaya ray) of Bhattis, invaded by Mahmúd, A. H. 393.
1012 Prithirájpál (Jaipál II?) of Delhi and Lahore, fled to Ajmír.
1016 Korra, (Kunwer ray—Kumárapál) king of Kanouj, surrendered to Mahmúd, in whose time the country was divided into principali-
Hardat, rája of Merat. [ties.
Chándpál or Calchandra, rája of Mathura.
Jundray?—Nanda ray of Kalinjar.
1022 *Jasuverma ?* rája of Ajmír.
1024 Byramdeo, (Brahma deva) of Gujerát deposed; and Sumnáth tem-
1026 Dabisalima (Saila deva) enthroned in his stead. [ple plundered.
1035 Daipal, governor of Sanpat, 40 miles from Delhi on road to Lahore; in Sewálik, Rám ray, another chief.
1043 ———, king of Delhi, with other rájas, retake Hassi, Tanesvar, &c. from Modood Ghiznaví.
1118 Balin, of Láhore; built Nágore in Sewálik; upset by Bairam Shah.
1192 Pitter Rai of Ajmír, } defeated Muhammed Ghori.
Candi (Cháwand) Ra of Delhi, }
1193 Hindu confederacy of 150 rájas defeated by do.
Jay Chand, of Kanouj, defeated
Hemraj, of Ajmír, expelled Pithiray's son.
Bhimdeva, of Gujerát; Goorkhas noticed, under Muhammed.
1215 Sahir deva of Narvar (Patan) defeated by Mahmud II.
— Uday-sa, tributary rája of *Jálwár.*
1231 Rája Dewbal, of Gualiar, reduced.
1246 Dilleki and Milleki rájas, of Kalinjar.
1253 Diepal, rája of Sitnur; raised rebellion in Sind.
1291 Rája of Rintinpur besieged by Feroz.
1294 Rámdeo, rája of Deogir, (Doulatábád.)
— Shankaldeo, his son, married Dewal devi, daughter of
Ray Karan, of Nehrwala, Gujerát; his wife, Kamlá devi.
Bhima deo, rája of Rintinbhore.
1299 Hambar deo, (Hamira,) his son besieged by Alla.
1304 Koka, rája of Málwá, overcome by Ein ul mulk.
1308 Nehr Deo, of Jálwar, surrendered to do.
Ray Ratan Sèn, of Chitor, escaped from Alla's camp.
—— his nephew confirmed in that principality.
Sital deo, rája of Sewana.
1309 Laddar deo, rája of Warangôl, made tributary.
Bílal deo, of Karnáta, resists Toghlak 1338, founds Vijyanagar.
1318 Harpál deo, son-in-law of Rám deo, flayed.
1340 Nag nak, Koly chief of Kondhana.—Prem ray, of Gujerát.
1347 Man deo, rája of Buglana.—Krishna ray of Vijyanagar.
1389 Ray Sarvar, rayrayan, of Behar.—Vinaek ray of Telingana.
1391 Narsinh Bhan of Gualior, Rahtore chief.—Narsinh of Kehrla.

* Wilford names this king Sadápála, or Sadasvápála. As. Res. ix. 211.

1402 Brahma deo, son of ditto, repelled Timur at Gualior.
1405 Ray Davood, and Hubboo of Toolumba.
1425 Ray Bheem of Jummo.—Deva ray, of Vijyanagar.
1446 Pertáb Sinh of Patiála and Kampila. 1452 Narsinh, his son.
1452 Prithivy ráy and Karan ráy.—Bhim ráj of Condapilly.
1471 Amber ray and Mangal ray of Orissa, 1470.
1478 ——— Gualior rája resisted Lodi.
—— Sangat Sinh, expelled from Etáwa.—Siva ray of Vijyanagar.
1490 Mán Sinh, of Gualior, receives dress of honor.
1518 Vicramajit, his son, killed by Baber, 1526, and Gualior reduced after 100 years independence.
1491 Saha deo, rája of Katra.
1493 Balbhadra ráy, of Kootumba, near Chunar. Narsinh ray, his son. Saliváhana, rája of Panná.
1501 Vinaik deo, of Dholpoor.
1528 Mán Sinh, rája of Gualior.
1533 Rana Sanka, of Chitor, (Sangráma Sinh)—finally reduced by Akber, [1570.
Rawel deo of Bagur. Medny rája of Chandery.
Manik chand and others killed.
1540 Maldeo, of Nagore and Ajmír, most powerful rája.
1542 Harkrishna ráy, of Rotás—killed by Shér Sháh.
1554 Ramchandra, rája of Panná and Kalinjar.
1556 Hemoo usurps the throne of Delhi—battle of Pánipat.
—— Ram-Sa, a descendant of Mán Sinh.
—— Jugmul and Devi Dás, rájas of *Márwár*, yield to Akber.
1567 Ujaya Sinha, of Udipur—Surjan ráy of Rintinbhore.
1570 Chandra Sén, son of Maldeo of Ajmír.
1572 Ráy Sinh, appointed to Jodhpur by Akber.
1586 —— his daughter married to Selim Mirza.

Table LI. Márhatta Governments*.

1. *Family of Sivají, rájas of Sattara.*

1644 Shahjí, a Subáhdár of the Carnatic under Aurangzéb, bestows jágirs on his sons—Tanjore on Ekojí—dies 1664.
1647 Siva'ji', his son, commences predatory expeditions.
1664 ———, plunders Surát, and assumes title of rája.
1669 ———, establishes a military government—dies 1680, April.
1680 Rája Rám, set up by minister—imprisoned at Raigarh.
—— Sambhaji', assumed the sovereignty—executed at Talapur, August 1689. Santa, usurped power—murdered 1698.
1689 Rája Rám, again proclaimed at *Sattara*, died 1700.
1700 Tárá Baí, his wife, assumed regency—incursions into Behár.
1707 Si'va'ji' II. son of Sambha, nicknamed Shao-ji, released on Aurangzeb's death, and crowned at *Satara*, March 1708—goes mad.
1749 Rám Rája, nominal successor—power resting with minister or *Peshwa.*
1818 Pertáb Sívá, or Sinh, re-instated at Satara by British, April 11.

2. *Hereditary Pèshwás of Púná.*

1740 Ba'la'ji' Bájí Rao, succeeds his father—dies after battle of Pánipat.
1761 Mádhují Rao Belál, 2nd son, invested as *nominal* Pèshwá, uncle Raghunáth, regent. Nána Farnavis, his kárkun—dies Nov. 1771.
1772 Naráyan Rao, youngest son of Bálají, murdered.
—— Raghunáth Rao (Ragoba), usurped.
1774 Mádhorao Naráyan, posthumous son of Naráyan, (Nána F. in power,) committed suicide 1795.
1796 Bájí Rao, proclaims himself; is taken by Sindia.
—— Chimnájí, furtively invested at Puna, 26th May.
—— Báji Rao, publicly proclaimed, 4th December.
1818 ———, surrenders to and pensioned by the English, 3rd June.

* The origin of Sivají is traced in the chronicles of Mewár to Ajaya Sinh rana of Chítor, 1300, (T. I. 269,) thus: Ajayasi, Sujunsí, Duleepjí, Seojí, Bhoraji, Deoraj, Oogursén, Maholjí, Khailooji, Junkojí, Suttoojí, Sambaji, Sivaji, Sambaji, Rámrája, usurpation of the Pèshwás.

3. *Bhúnsla Rájas of Nágpur.*

1734 Raghúji Bhúnsla, nominated "Séna Sáhib Subá" or general in Márhatta confederacy.
1750 ————————, received sunud of Berár from Pèshwá, dies 1753.
1753 Januji, eldest son, adopted his nephew
1772 Raghúji, eldest son of Madhojí, removed by Madhorao in favor of
1774 Sabají (his uncle), killed in action soon after by Mudají.
1816 Parsáji, succeeded his father Raghují: an idiot—strangled by
—— Múdáji (Appa Sáhib), acknowledged by English—deposed 1817-18.
1818 May, Goozur, grandson of Raghují, seated on musnud by do.

4. *The Sindia family, from a village near Satara, now Gwalior Rájas.*

1724 Ranují Sindia, an officer in the Pèshwá's army.
1750 Jyapa, succeeded to his father's jágír of half of Málwá, murdered 1759.
Dáttají, 2nd son of Ranují, engaged in the Panjáb wars.
1769 Mahádají, 3rd, illegitimate, confirmed in jágír by Madhorao, died 1794.
1794 Doulut Rao, his grand-nephew, adopted: fixed his camp at Gwalior, 1817.
1825 Baiza Bái, his widow, adopted Jankují, and acted as regent.
1833 Jankují, assumed the reins of government.

5. *The Holkar Family.*

1724 Mulhár Rao Holkar, a Sudra, an officer of note in the Pèshwá's army.
1750 ————————, obtained jágír in *Málwá*, died 1767.
1767 Málí Rao, grandson, succeeded under regency of
Ahilya Bái, his mother, but died soon after.
—— Tukají Holkar, (no relation) appointed to command of troops.
1797 Jeswant Rao Holkar, illegitimate son—maintained predatory rule.
1805 ————————, confirmed in jágír of Indore, &c.—died insane.
1811 Tulsi Bai, widow, adopted his illegitimate child
—— Mulhár Rao Holkar; battle of Mehadpur, December 1818.
1834 Martand Rao, adopted son, dispossessed by
—— Hari Holkar, present chief.

6. *Gaikwar family—now reigning at Baroda, Gujerát.*

1720 Dammají Gaikwár (Shamsher Behádur), officer under Khandí Rao Holkar.
1731 Pilají Gaikwar, nominated *Séna Khas Khèl*—murdered.
1732 Dammaji, son, occupied east of Gujerát, died 1768.
1768 Govind Rao, 2nd son, succeeded; but eldest, Syají, an idiot, supported by
1771 Fatih Sinh, youngest, who held real power at Baroda.
1790 Mannaji Rao, assumed charge of Syají, as regent—died 1793.
1793 Govind Rao, made regent 19th December, died September 1800.
1800 Ananda Rao, eldest son—disputes with Mulhár and Kanhají.
1805 ————————, Treaty with British government.
—— Fatih Sinh.

Table LII. Si'kh Government of Láhore.

A. D.
1419 Na'nak, founder of the Síkh sect, born.
—— Guru Angad, wrote some of the sacred books.
1552 Amera dás, Khetri.
1574 Rám dás, beautified Amritsir.
1581 Arjun Mal, compiled the *A'di Granth.*
1606 Har Govind, first warlike leader.
1644 Har Ray, his grandson.
1661 Har Krishna, died at Delhi.
1664 Tegh Behádur, put to death by Moslems.
1675 Guru Govind, remodelled the Síkh government.
1708 Bandu, last of the succession of Gurus—put to death by Aurangzeb.
—— Predatory bands—internal feuds.
12 *misals* or tribes of Síkhs captured *Láhore* and occupied *Panjáb.*
Charat Sinh, of Sukelpaka misal, died 1774.
1774 Mahá Sinh, his son, extended his rule—died 1792.
1792 ———, his wife, regent, with Lákhpat Sinh minister.
1805 Ranji't Sinh, (born 1780,) established Lahore independency.

BUDDHIST GENEALOGIES.

TABLE LIII. CHINESE AND JAPANESE CHRONOLOGY.—*From M. Klaproth's translation, Paris*, 1833.

[*Tho Japanese names are distinguished by the letter* J.]

Ta chen seng wang.
I szu ma wang.
Yeon lo tho wang.
Kio lo wang.
Ni feon lo wang.
} Genealogy of SA'KYA, according to the *Bauddha* works of the Chinese.

Szu tsu kie wang (Sans. *Sinhahána-kabána.*

Tsing fan wang, *Suddodana*, (and three brothers, Sans. *Suklodana, Amitídana*, and *Dhotodana.)*

B. C.

1027 Si tho to, nan tho, Chykia, (SA'KYA MUNI,) born.
999 Sákya becomes eminent in 8th year of AJATASVARA of *Magadha.*
949 Sákya or Buddha (Fo); attains nirvána, (dies.)
868 Anan *(Ananda)*, second patriarch, dies.
833 A yu wang (J. *A ik ô)* (Sans. *Asoka)*, dies.
806 Changna ho sieou, 3rd patriarch, dies.
741 Yeou po kiu to (J. *Ou fa kik ta)*, 4th patriarch, dies.
692 Thi to kia (J. *Dei ta ka)*, 5th ditto, dies at *Mathurá.*
687 Weng chu, disciple of Sáríputra.
660 Commencement of Japanese monarchy.
637 Mi chu kia (J. *Mi sia ka)*, 6th patriarch of *Magadha*, dies.
604 Lao tan (J. *Rô tan)*, founder of *Tao tsu* sect in China, dies.
590 Pho siu mi (J. *Fá siu mi)*, 7th patriarch, dies in N. India.
551 CONFUCIUS, born in the kingdom of *Lore.*
550 500 *arhans* of Kashmír (*ka sits mi ra*) preach the law.
535 Foe tho nan ti (J. *Boudz da nan dai)*, 8th patriarch (Sans. *Boudhánandi)* of Canara, dies.
487 Fou tho mi to (Sans. *Boudhámita*), 9th ditto, dies.
442 Hie, 10th patriarch of Central India, dies.
383 Fo na ye che, 11th ditto of *Palibothra*, dies.
327 Ma ming ta szu, 12th ditto (Sans. *Asvagocha)* of Benares, dies.
264 Kia pi mo lo, 13th ditto of West India, dies.

Commencement of the Tsin Dynasty of China.

212 Loung chou, 14th ditto of Central India, dies.
161 Kia na chi pho, 15th ditto of W. India.
130 Ko li nan tho, makes an image of Mi le in India.
113 Lo hoei lo to, 16th patriarch of *Kapila*, dies.
74 Sang kia nan thi, 17th do., born at *Chi lo fa*, dies.
13 Kia ye che to, of *Ma ti*, 18th ditto, dies.
2 King hian fetches Buddhist scriptures from the kingdom of *Yue tí.*

A.D. 22* Kieu mo lo to, of *Ferghána*, 19th patriarch, dies.
24 to 57 Hindus carry Buddhist religion into Java.
65 Buddhism introduced at the court of *Ming ti*, Emp. of China.
74 Tu ye to, 20th patriarch of India, dies.
117 Pho sieou phan theou, 21st ditto, dies.
165 Mo nou lo, of *Nati*, 22nd ditto, dies.
209 Ho le na, of *Ferghána*, 23rd ditto, dies.
259 Szu tsu pi khieu, of *Magadha*, 24th ditto, dies.
266 to 313 The *Prajná páramita* translated into Chinese.
300 Won lo tchhu, of *Khotan*, translates the Fang kouang king.
325 Pho che szu to, of *Ki pin* or Cábul, 25th patriarch, dies.
372 Introduction of Buddhism into *Kaoli* (Corea.)
382 Kieon mo lo chy, settles in China and translates *Mahá Prajná.*
384 Introduction of Buddhism into *Pe tsi* (in Corea).
388 Pou jou my to, 26th patriarch of India, dies.
399 Chy fa hian visits India to study.

* The Chinese MS. of the Bibliotheque du Roi ends here.—M. Klaproth derives the continuation from other Chinese and Japanese authors.

407 Introduction of Buddhism into Tibet, under *Hlato tori.*
414 Chy fa hian returns to *Chang nyan.*
429 Death of Foe fou pha tho lo, of *Kapila vástu,* who translated the *Hou-yan king* in China.
457 Pan jo to lo (*Prajná dhara*) of S. E. India, 27th patriarch, dies.
499 Pou thi ta ma (*Bodhí dharma*), 28th patriarch of N. India, settles in China, as 1st patriarch of that country, dies in 508.
506 Sang kia pho lo, of *Fou nan,* made chief of Chinese Buddhist temples, by the Emperor *Siuan ven ti;* dies in 525.
528 Introduction of Buddhism into *Sin lo* or *Sinra* (in Corea).
552 Ditto into Japan.
592 Death of Hoei kho ta szu, 2nd patriarch of China.
606 Seng lin ta szu, 3rd ditto, dies.
629-645 Yuan honang, samanean of the *Chhin* family, travels in India, and translates many books.
632 General introduction of Buddhism into Tibet, under *Srong dbzan gampo.*
651 Death of Tao tin ta szu, 4th patriarch of China.
675 Death of Houng jin ta szu, 5th patriarch of China.
676 Ti pho ho lo, priest of *Magadha,* visits China and translates books.
699 Chy chha nan tho, of *Cábul,* ditto, dies in 710.
713 Hoei neng ta szu, last patriarch of China, dies.
732 Pou koung, a brahman *sramana* visits China and translates the questions of *Manju Sri,* (*Kin kang ting king.*)
814 (about) Phan jo, priest of *Cábul,* settles in China, and translates the *Houa yan king.*
854 Phan jo, made *Fa pao ta szu,* grand master of the treasure of religion.

Table LIV. Buddhist Chronology of Tibet.

From the Vaidúrya Karpo, written at Hlassa in the year A. D. 1686. *Translated in Csoma's Tibetan Grammar, p.* 181.

B. C. 962 Birth of Shakya (*Chomdándás*).
882 The *Kála Chakra* system taught by him; his death.
881 The *Mula Tantra* compiled at *Shambhala.*
879 Death of Zla bzang, king and author of ditto.
878 Padma Sambhava born.
838 Manju Ghosha born in China.
432 Nágarjuna born.
278 Rigs-dan-grags-pa, ascended the throne of *Shambhala.*
A. D. 252 Nyan-tsan, king of Tibet, (Thothori,) died 371.
618 Doctrine of "endeavouring perfection" upheld.
622 Nam-gyal, king of Shambhala; epoch of 403 years, called *Mekha gya-tso,* commenced.
627 Srong-tsan gam-bo born.
639 Kong-cho, a Chinese princess, arrived in Tibet.
651 *Phrul-snang* college, or *Vihar,* built at *Lhassa.*
728 Khri srong, king of Tibet.
747 Padma Sambhava arrived in Tibet; returned to India, 802.
804 A new astronomical period commenced.
861 Langtarma born; abolished Buddhism, 899.
965 *Kala Chakra* system introduced into India.
971 Restoration of Buddhism.
980 Atisha born.
1002 Brom-ton, the teacher, born.
1015 *Sol-nag thang* monastery founded.
1024 Mekha gya-tsho era terminated.
1025 *Kala Chakra,* or Jovian cycle, established in Tibet.
1038 Milaraspa born.
1052 Lang rithang pa born.
1055 *Ragreng* college founded.
1057 Lo-dang shesrab, the translator.
1071 Monasteries of *Sangphu* and *Sakya* founded.
1077 Tagpo-lha-je born.

1079 *Grathang* monastery founded.
1082 Ras-chhung pa born.
1090 Kun-gah-nying-po, the great *Sáskya* Lama, born; died 1156.
1108 Phag-mo-grub-pa born.
1118 Period of "deep meditation" commenced.
1121 Yubrag pa born.
1125 SHA'KYA SRI born.
1134 Nyang, the prince, born.
1156 The *Thel* monastery founded.
1173 The *Tshal* monastery founded.
1177 The *Bri-gung* monastery founded.
1178 The *Stag-lung* ditto.
1180 The great Sákya pandit born.
1185 *Gung-tang* monastery founded.
1202 Shákya Srí, of Cashmir, arrived in Tibet.
1210 Ter-ton Lama born.
1211 The *Lang-tang* monastery founded.
1223 The *Byang* and *Dor* ditto.
1233 Gro gon phagspa born, mastered Tibet 1251.
1253 The *Chhos-lung* monastery founded.
1288 Bu-ton born.
1300 Ta-si-byang chhub-gyal tshan born.
1347 Theg-chhen chhos gyal born; became Tari (king) 1347.
1347 *Thes-thang* monastery founded.
1355 Incarnation of Tsong-khapa; died 1417.
1383 Thang-tong-gyal-po born.
1389 Ge-dun-grub-pa born.
1403 Shes-rab, the great interpreter, born.
1407 Yearly confession at Lhassa, established by ditto.
1414 Karma pa born; *Bras-pungs Vihár* founded.
1417 The *Sera* monastery founded.
1419 The *Sang-nags-khar* ditto.
1421 Dus-zhabs-nor-zang-gya-tsho born.
1427 The *Nor* monastery founded by the *Sa-skyas*.
1429 Ge-legs pal-dan succeeded to the *Gal-dan* chair.
1433 The *Nalenda* monastery was founded.
1435 The *Chhab-do-byams-gling* ditto.
1436 Zha-lu-legs-pa succeeded at *Gal-dan*.
1437 The *Pal-khor* chaitya built.
1439 *Lotsava* chhos-kyong-zang-pa born.
1445 The *Pod-kar hal lung*, work on Lunations, &c. written.
1447 The *Bras-yul* monastery founded.
1448 Lo-gros succeeded at *Galdan*.
1461 Baso ditto.
1462 The *Gong-kar* Vihár founded.
1467 The *Ser-dog-chan* ditto.
1470 The *Byams-gling* ditto.
1471 Logros-tan-pa succeeded at Gah-dan; died 1473.
1474 Incarnation of Gé-dun gya-tsho; died 1540.
1476 The Ta-nag thub stan-nam gyal monastery founded.
1478 Mon-lam-pal succeeded at Gah-dan.
1500 Tshar chhen born.
1507 The *Chhos-khor* monastery founded.
1535 Khas grub pal gyi sengè born.
1541 Snod-nams gya-tsho born; died 1586.
1575 ——— invited by Althun khán, a Mongol prince.
1576 ——— built the *Chhos-khor-ling* monastery.
1587 Yon-tan gya-tsho born; died 1614.
1615 Nag-vang lo zang gya-tsho born.
1618 Period of "morality" commences.
1625 Rigs-dan sengè, succeeds at *Gah-dan*.
1639 Stan dsin chhos gyal, king of Tibet.

1640 Nag vang lo zang conquered whole of Tibet.
1643 ——— founded the *Potala* (residence).
1650 ——— visited China.
1686 This Chronology compiled at Lhassa.

Table LV. Kings of Tibet,

To the subdivision of the country in the tenth century : from the Depter non po, or ancient Records of Zhonnu Pa'l, *in Tsang, or middle Tibet ; extracted and translated by M. A. Csoma Körösi.*

*g*Nyah khri *b*tsanpo—(about two hundred and fifty years B. C.)
Khri *b*tsanpo hod*l*dé, } These two names may design the same person,
Mukhri *b*tsanpo, } according to different authorities.
Dingkhri *b*tsanpo.
So khri *b*tsanpo.
Mér khri *b*tsanpo.
*g*Dags khri *b*tsanpo.
Sribs khri *b*tsanpo.
Grigum *b*tsanpo.
Spudé gung *r*gyel.
Esho legs.
Désho legs.
Thiso legs.
Guru legs.
*h*Grong zhi legs.
Isho legs.
Za nam za *l*dé.
*l*Dé *h*dul-nas *g*zhung *b*tsan.
Sé *r*nol nam *l*dé.
Sé *r*nolpo *l*dé.
*l*Dé *r*nol nam.
*l*Dé *r*nolpo.
*l*Dé *r*gyelpo.
*l*Dé Srin *b*tsan.
*r*Gyel tori long *b*tsan.
Khi *b*tsan, or Khri *d*Gah.
*d*Pungs *b*tsan.
Khri thohi *r*jes grogs *b*tsan.
Lha Thothori *g*Nyan *b*tsan—(five hundred years after the first king,) A. D. 407, see Chinese list.
Khri *g*Nyan *g*zugs *b*tsan.
*h*Gro *g*Nyan *l*dem-bu.
Stagri *g*Nyan *g*zigs.
*g*Nam ri srong *b*tsan.
Srong *b*tsan *s*gampo—born A. D. 627.
Gung srong gung *b*tsan—(died before his father.)
Mang srong mang *b*tsan—(son of Srong *b*tsan, &c.)
*h*Dus sang mangpo *r*jé.
*k*Lung nam *b*srunggi *r*gyelpo.
Khri *l*dé *g*tsug *br*tan més ats'hogs.
Khri srong *l*de *b*tsan—(born A. D. 726.)
Muné *b*tsanpo.
Khri *l*dé srong *b*tsan (or Mutig *b*tsanpo.)
Ralpa chen.
Khri hum *b*tsan *d*pal. (or *k*Langdar ma ?)—A. D. 900.
*g*Nam *l*dé hod srungs—(in the 10th century ; anarchy.)
*d*Pal *h*khor *b*tsan—(division of Tibet into several small principalities.)
*b*Kra shis *br*tségs *d*pal.
Skyid *l*dé Nyima *m*gon.
*d*Palgyi *m*gon—(occupied *Maryul* or *Ladags.*
*b*Krashis *l*dé *m*gon—(took possession of *Spurangs.*)
*l*Dé *g*tsug *m*gon—(ditto of

Then follow the names of some kings or princes who reigned in *Gugé* and *Spurangs* (or in general, in *Nári*), above *Garhwal* and *Kamaon*, commencing with the 10th century. At *Lé* in *Ladags* may be found the names of the kings that successively reigned in that principality; but I could not procure them. There is great confusion in the series of the princes that reigned in *Nári*, and their enumeration would be of little interest. There are in Tibet several works containing lists of the descendants of Nyá khri tsánpo, the first king, whom they derive from the *Litsabyi* race, in India; but in different authors, the orthography sometimes varies, and even the whole name is differently stated. This, which I now communicate, has been taken from the *Dep-ter hon-po*, "Ancient records," written by ZHONNU PA'L, a learned religious person, who lived some centuries ago, and belonged to the *Sa-skya* religious sect, in g*Tsang*, in middle Tibet.—A. C.

TABLE LVI. BURMESE CHRONOLOGICAL TABLE, *translated in Crawford's Embassy.*

B. C.	S. E.	
691		The grand epoch established by An-ja-na, the grand father of Gautama.
628		Gautama born.
608		Gautama began to reign.
589		Gautama obtained deification (became a Buddha).
551		Ajatasat began to reign.
544		Gautama died and obtained nib-b'han (annihilation).
543	1	The Sacred Epoch established by king Ajatasat.
520	24	His son, U-da-ya-bad-da, began to reign.
496	48	His son, Muny-da, and after him, his son, Na-ga-da-sa.
485	59	Maha Sam-b'ha-wa.
478	66	His younger brother, Chula Sam-b'ha-wa, began to reign.
472	72	Su-sa-na-ga, in Maj-ji-ma (Central India).
453	91	His son Ka-la-san-ka, in Maj-ji-ma.
443	101	Twat-ta-paong, the founder of Sa-re-k'het-ta-ra, (or Ras-se Myo, vulgarly called Prome.)
426	118	His son Bat-la-se-na, in Maj-ji-ma.
404	140	Nan-da began to reign, and was followed by eight kings of the same name, in Maj-ji-ma.
392	162	Chan-ta-kut-ta, in Maj-ji-ma. (Chandragupta.)
376	168	His son Bin-tu-sa-ra, in Maj-ji-ma.
373	171	His son Twat-ta-ram, in Prome.
351	193	His son Ram-b'haong, in Prome.
330	214	His son D'ham-ma-sau-ka, in Maj-ji-ma.
326	218	D'ham-ma-sau-ka received the sacred affusion (Ab'hi-se-sa).
320	224	Prince Ma-hin-d'ha became a priest, (Rahan,) and his sister, Princess San-g'ha-mit-ta, a priestess, (Rahan.)
307	237	The period of the third rehearsal of the communications of Gautama. The priest Ma-hin-d'ha went on a religious mission to Si-ho (Ceylon).
301	243	Ra-han-man, son of D'ham-ma-sau-ka, began to reign in Prome.
289	255	Death of D'ham-ma-sau-ka, (literally "his going to Heaven.")
251	293	His son or grandson, Kak-k'han, began to reign in Prome.
219	325	His son Khan-laong, in Prome.
182	362	His son Lak-k'hong, in Prome.
148	396	His son Si-k'han, in Prome.
118	426	His son Si-ri-rak, in Prome.
111	436	Ta-pa-mang, in Prome.
94	450	The communications of Gautama reduced to writing in Ceylon.
60	484	Ta-pa-man's son, Pi-ram, in Prome.
39	505	Ram-mak-k'ha, in Prome, and his son.
A. D.		
21	565	Ram-sin-ga, in Prome, and his son.
54	568	His son Ram-mun-cha-lin-da, in Prome.

39 593 His brother Be-rin-da, in Prome.
54 598 His son Mun-ja, in Prome.
56 600 His son Pu-nyan-nya, in Prome.
59 603 His brother Sa-k'ha, in Prome.
62 606 Sa-k'hi, in Prome.
65 609 His younger brother, Kan-un, in Prome.
66 610 His elder brother, Kan-tak, in Prome.
69 613 His elder brother, Bin-ja, in Prome.
73 617 His son Su-mun-dri, in Prome.

P. E.

76 1 The Prome Epoch, established by king Su-mun-dri.
80 2 His son Ati-tra, in Prome.
83 5 His brother Su-panya-na-ga-ra-chin-na, in Prome.
94 16 Death of king Su-panya-na-ga-ra-chin-na.
107 29 Sa-mud-da-raj began to reign, in Pugan.
152 74 Ras-se-kyaong, in Pugan.
167 89 Phru-chau-ti, in Pugan.
242 164 His son T'himany-rany, in Pugan.
299 221 His son Rang-mang-pok, in Pugan.
324 246 His son Pok-san-lany, in Pugan.
386 308 Bud-d'ha-gau-sa went to Ceylon.
387 309 Pok-sang-lany's son, Kyaong-du-rach, began to reign.
412 334 His son, Sany-t'han.
469 391 Muk-k'ha-man, and Su-rai.
494 416 Sany-t'han's great grandson, Ra-mwan-mya.
516 438 Sok-ton.
523 445 His son Sang-lang-kyaung-ngai.
532 454 His brother Sang-lang-pok.
547 469 His brother K'han-laong.
557 579 His brother K'han-lap.
569 491 His son T'hwan-t'hok.
582 504 His son T'hwan-prach.
498 520 His son T'hwan-khyach.
613 535 Pup-pa-chau-ra-han.

V. E.

639 1 The present vulgar Epoch, established by Pup-pa-chau-ra-han.
640 2 His son-in-law, Shwe-bun-si, succeeded.
652 14 His brother Pis-sun.
660 22 His son Pit-taung.
710 72 His brother Na-k'hwe.
716 78 Myang-ka-kywe.
726 88 Sing-ga.
734 96 Sing-k'hwan.
744 106 His son Shwe-laung.
753 115 His son T'he-wan-twang.
762 124 His son Shwe-mauk.
766 128 His son Chau-k'hang-nach.
785 147 His brother T'hwan-lwat.
829 191 His son K'hai-lu.
846 208 His brother Pyany-bya.
864 226 His son Tan-nak.
889 251 Sin-chwan, and his brother, Cha-le-nga-kwe.
914 276 His son Sing-g'ho.
930 292 Taung-su-kri, (the mountain chief.)
945 307 Kwan-chau-Kraung-pru.
966 328 His son Kraung-cho.
972 334 His brother Chuck-ka-té.
997 359 Kraung-p'haus'son Nau-ra-t'ha-chau.
1030 392 His son Chau-lu.
1056 418 Kyan-chach-sa.
1081 443 His grandson Alaun-chany-su.
1151 513 His son Ku-la-kya.

1154 516 His son Mang-rai-na-ra-sung-ga.
1157 519 His brother Na-ra-pa-ti-chany-su.
1190 552 His son Je-ya-sing-ga, or Nan-taung-mya-mang.
1212 574 His son Kya-chwa.
1227 589 His son Uch-cha-na.

A. D.	V. E.	
1233	595	His brother Mang-k'hen-k'hye.
2771	639	His son Kyany-chwa.
1291	653	His son Chau-nach.
1300	662	Ta-chi-shang-si-ha-su, in Panya.
1313	675	His son Chau-mwan-nach, in Panya.
1322	684	His son Uch-cha-na. This year Asang-k'ha-ra-chau-rwan founded Chit-kaing, and began to reign.
1330	692	His elder brother, Ta-ra-bya-kri, in Chit-kaing Sagaing.
1342	704	His younger brotherNa-chi-shang-kyany-chwa, in Chit-kaing.
1351	713	His son Kyany-chwa, in Chit-kaing.
1356	718	Chau-mwan-nach died, and Pugan was destroyed.
1362	723	Kyany-chwa's brother, Mau-pa-na-ra-su, in Chit-kaing.
1364	726	His elder brother Uch-cha-na-praung, in Chit-kaing. This year Sa-to-mang-bya founded Angwa (Ava), and began to reign; Chit-kaing and Panya were destroyed.
1377	739	His father-in-law, Many-kri-chwa, in Ava.
1401	763	His son Ta-ra-bya-kri, in Ava, succeeded the same year by Mang-kaung 1st.
1422	784	His son Chany-pru-shang-si-ha-su, in Ava.
1425	787	His son Many-l'ha-gray, in Ava; succeeded the same year by Ka-le-kye-ngo.
1426	788	Mo-n'hany-mang-ta-ra, in Ava.
1439	801	His son Mang-rai-kyany-chwa, in Ava,
1442	804	His brother Na-ra-pa-ti-kri, in Ava.
1468	830	His son Mang-k'haung 2nd, in Ava.
1501	863	His son Shwe-nan-kyany-shang, in Ava, (proper name, Na-ra-pa-ti.)
1526	888	Mo-n'hany-so-hau-pwa, in Ava.
1541	903	Un-b'haung-chan-b'hwa, in Ava.
1546	908	His son Mo-bya-na-ra-pa-ti, in Ava.
1551	913	Cha-kong-chany-su kyaoy-taung, or Na-ra-pa-ti gan, in Ava.
1554	916	Sa-to-mang-chau, in Ava.
1565	927	Prany-chun-mang-rai-kyany-chwa, in Ava.
1597	959	Nyaung-ram-man-kri, in Ava.
1605	967	His son Anauk-pak-lwan-mang-ta-ra-kri, in Ava.
1629	990	Sa-lwan, in Ava.
1648	1010	His son Na-dat-da-ya-ka, in Ava.
1661	1023	His brother Prung-mang, in Ava.
1672	1034	His son Na-ra-wara, in Ava; succeeded the same year Mang-rai-kyany-tang, grandson of Sa-lwan.
1698	1060	His son Man-aung-ra-da-nga-da-ya-ka, in Ava.
1714	1076	His son Chang-p'hru-shang, in Ava.
1733	1095	His son K'haung-tbit, carried captive to Han-sa-wati.
1752	1114	Alaung-b'hu-ra (Alompra) began to reign at Mut-cho-bo (Monchabo.)
1760	1122	His son U-pa ra-ja, at Chit kaing.
1763	1125	His brother Chany-p'hru-shang (Sembuen), at Ava.
1776	1138	His son Chany-ku-cha, at Ava.
1781	1143	His cousin Paung-ka-cha, commonly called Maung-mang, son of U-pa ra-ja, at Ava; succeeded the same year by his uncle Pa-dun-mang, or Man-ta-ra-kri, son of A-laung-b'hu-ra, and founder of A-ma-ra-pu-ra.
1819	1181	His present Majesty, grandson of Pa-dun-mang, ascended the throne at A-ma-ra-pura.
1822	1184	Ava re-built, and made the capital.

Table LVII. Chiefs of Labong *and* Zimmay.—*(Northern Laos of Europeans; Yeun Shan of the Burmese.)*

From the Native Records consulted by Dr. D. Richardson, 1834. MS.

A. D.	S. E. Bud.	
576	1118	Wathoo daywa (Vâsudeva) and Taka danda, founded *Labong.*
578	1120	Placed Vamâ on the throne (or Zamma devî), daughter of the king of *Chandapur*, widow of *Cambodia* raja.
		35 Kings, or "Lords of the White Elephant."
		Aditza-woon-tha built the Pagoda.
		19 kings to
	V. E.	Bénya men yea (in Burmese, Dolana.)
1289	651	Benya tso men yea, changed the capital; thrice married into Pegu family.
1294	656	——— founded *Zimmay.*
1331	693	Nga then patchoon, his son.
1333	695	No tchoon ta yung.
1334	696	Na tchoon tareung.
1336	698	Ngathenpoo.
1345	707	Tso kanprú.
1347	709	Tso boa you.
1369	731	Goona.
1377	739	Gnathen numa.
1380	742	Thambi.
1420	782	Tso Benya.
1455	817	Tso neat.
1463	825	Benya yothee.
1503	865	Tso myn ar.
1537	899	Benya tsay.
1542	904	Tso myne.
1544	906	Zalapaba, his daughter, called there tha Dama mahadeví.
1558	920	Len bue mya shee, king of *Pegu*, took the town.
———	———	His son Narata 'tso.
1628	990	Ladong family restored.
1630	992	Thadau dama yaza of Pegu regained it.
1763	1125	Nso oung recovered his independence.
———	———	Lenbu Sheen, son of Alompra of *Ava*, took it.
1774	1136	Benya sa Ban rebelled, threw off Burmese yoke, and joined *Bankok* allegiance.
1778	1140	Chou chee weet, present king.

Table LVIII. Sovereigns of Ceylon.

From the Ceylon Almanack, the Honorable George Turnour's *Epitome.*

B. C.	*Names.*	*Relationship of each succeeding sovereign.*
543	Wejaya, (Vijaya)	The founder of the Wejayan dynasty.
505	Oopatissa 1st, ...	Minister—regent.
504	Panduwaasa, ...	Paternal nephew of Wejaya.
474	Abhaya, ...	Son of Panduwaasa—dethroned.
454	Interregnum.	
437	Pandukaabhaya, (capital *Anuradhpura,)*	Maternal grandson of Panduwaasa.
367	Mootaseewa, ...	Paternal grandson.
307	Devenipeatissa, ...	Second son.
267	Oottiya, ...	Fourth son of Mootaseewa.
257	Maha-seewa, ...	Fifth ditto.
247	Suratissa, ...	Sixth ditto—put to death.
237	Sena and Goottika, ...	Foreign usurpers—put to death.
215	Asela, ...	Ninth son of Mootaseewa—deposed.
205	Elaala, ...	Foreign usurper—killed in battle.

161	Dootoogaimoonoo, ...	Son of *Kaawantissa.*
137	Saidaitissa, ...	Brother.
119	Toohl or Thullathanaka, ...	Younger son—deposed.
119	Laiminitissa 1st, or Lajjetissa,	Elder brother.
109	Kaloonna or Khallaata Naaga,	Brother—put to death.
104	Walagambahoo 1st, or Wattagaamini, ...	Brother—deposed.
103	Pulahattha, (usurpers,)	14. 7—Foreign usurpers—successively deposed and put to death.
100	Baayiha, ...	
98	Panaymaaraa, ...	
91	Peliyamaaraa, ...	
90	Daathiya, ...	
88	Walagambahoo 1st.	Reconquered the kingdom.
76	Mahadailitissa or Mahachoola,	Son.
62	Choora Naaga, ...	Son—put to death.
50	Kooda Tissa, ...	Son—poisoned by his wife.
47	Anoola, ...	Widow.
41	Makalantissa or Kallakanni Tessa, ...	Second son of Koodatissa.
19	Baatiyatissa 1st, or Baatikaabhaya, ...	Son.
A. D.		
9	Mahadailiya Maana, or Daathika, ...	Brother.
21	Addagaimoono or Aamanda Gaamini, ...	Son—put to death.
30	Kinihirridailla, or Kanijaani Tissa, ...	Brother.
33	Kooda Abhaa or Choolaabhya,	Son.
34	Singhawallee or Seewalli, ...	Sister—put to death.
35	Interregnum.	
38	Elloona, or Ila Naaga, ...	Maternal nephew of Addagaimoono.
44	Sanda Moohoona, or Chanda Mukha Seewa,.....	Son.
52	Yasa Siloo, or Yataalakatissa,	Brother—put to death.
60	Subha, ...	Usurper— put to death.
66	Wahapp, or Wasahba, ...	Descendant of Laiminitissa.
110	Waknais, or Wanka Naasika,	Son.
113	Gajaabahoo 1st, or Gaamini,..	Son.
125	Mahaloomaana,or Mallaka Naaga,.....	Maternal cousin.
131	Baatiya Tissa 2nd, or Bhaatika Tissa, ...	Son.
155	Choola Tissa,or Kanittha Tissa,	Brother.
173	Koohoona or Choodda Naaga,	Son—murdered.
183	Koodanaama or Kooda Naaga,	Nephew—deposed.
184	Kooda Sirinaa, or SiriNaaga 1st,	Brother-in-law.
209	Waiwahairatissa or Wairatissa,	Son—murdered.
231	Abha Sen, or Abha Tissa, ...	Brother.
239	Siri Naaga 2nd., ...	Son.
241	Weja Indoo, or Wejaya 2nd,	Son—put to death.
242	Sangatissa 1st, ...	Descendant of Laiminitissa—poisoned.
246	Dahama Sirisanga Bo, or Sirisanga Bodhi 1st, ...	Do. do.—deposed.
248	Goloo Abhaya, Gotha Abhaya or Meghawarna Abhaya,....	Do. do.
261	Makalan Detoo Tissa 1st, ...	Son.
275	Maha Sen, ...	Brother.
302	Kitsiri Maiwan 1st, or Kirtissri, Meghawarna, ...	Son.
330	Detoo Tissa 2nd, ...	Brother.

339	Bujas or Budha Daasa,.....	Son.
368	Oopatissa 2nd, ...	Son.
410	Maha Naama, ...	Brother.
432	Senghot or Sotthi Sena, ...	Son—poisoned.
432	Laimini Tissa 2nd, or Chatagaahaka, ...	Descendant of Laimini Tissa.
433	Mitta Sena, or Karalsora,....	Not specified—put to death.
434	Paandu, ...	24. 9—Foreign usupers.
439	Paarinda Kooda, ...	
455	Khudda Paarinda, ...	
455	Daatthiya, ...	
458	Pitthiya, ...	
459	Daasenkelleya, or Dhaatu Sena,	Descendant of the original royal family —put to death.
477	Sigiri Kasoomboo, or Kaasypa 1st, ...	Son—committed suicide.
495	Moogallaana 1st, ...	Brother.
513	Koomaara Daas, or Koomaarau Dhaat Sena,.....	Son—immolated himself.
522	Kirti Sena, ...	Son—murdered.
531	Maidi Siwoo, or Siwaka,.....	Maternal uncle—murdered.
531	Laimini Oopatissa 3rd, ...	Brother-in-law.
534	Ambaherra Salamaiwan, or Silaakaala, ...	Son-in-law.
547	Daapuloo 1st, or Daatthaapa Bhodoi, ...	Second son— committed suicide.
547	Dalamagalan or Moogallaana 2nd, ...	Elder Brother.
567	Kuda Kitsiri Maiwan 1st, or Kirtisri Meghawarna,.....	Son—put to death.
586	Senewi or Maha Naaga, ...	Descendant of the Okaaka branch.
589	Aggrabodhi 1st, or Akbo, ...	Maternal nephew.
623	Aggrabodhi 2nd, or Soola Akbo,	Son-in-law.
633	Sanghatissa, ...	Brother—decapitated.
633	Boona Moogalan, or Laimini Bonaaya, ...	Usurper—put to death.
639	Abbaseggaaheka, or Asiggaaheka,.....	Maternal grandson.
648	Siri Sangabo 2nd, ...	Son—deposed.
648	Kaloona Detootissa, or Laimina Katooreya, ...	Descendant of Laimini Tissa—committed suicide.
649	Siri Sangabo 2nd, ...	Restored, and again deposed.
665	Daloopeatissa 1st, or Dhatthopatissa, ...	Laimini branch—killed in battle.
677	Paisooloo Kasoombo, or Kaasaypa 2nd, ...	Brother of Sirisangabo.
686	Dapuloo 2nd, ...	Okaaka branch—deposed.
693	Daloopeatiss 2nd, or Hatthadatthopatissa,.....	Son of Daloopeatissa 1st.
702	Paisooloo Siri Sanga Bo 3rd, or Aggrabodhi.....	Brother.
718	Walpitti Wasidata, or Dantanaama,.....	Okaaka branch.
720	Hoonnonara Riandalaor Hatthadatha, ...	Original royal family—decapitated.
720	Mahalaipaanoo, or Maanawamma,.....	Do. do. do.
726	Kaasiyappa 3rd, or Kasoombo,	Son.
729	Aggrabodhi 3rd, or Akbo, ..	Nephew.
769	Aggrabodhi 4th, or Kuda Akbo,	Son, (capital *Pollonnaroowa.)*
715	Mihindoo 1st, or Salamaiwan,	Original royal family.
795	Dappoola 2nd,.....	Son.

800	Mihindo 2nd, or Dharmika-Seelaamaiga, ...	Son.
804	Aggrabodhi 5th, or Akbo, ..	Brother.
815	Dappoola 3rd, or Kuda Dappoola, ...	Son.
831	Aggrabodhi 6th, ...	Cousin.
838	Mitwella Sen, or Selaamaiga,	Son.
858	Kaasiyappa 4th, or Maaganyin Sena, or Mihindoo, ...	Grandson.
891	Udaya 1st, ...	Brother.
926	Udaya 2nd, ...	Son.
937	Kaasiyappa 5th, ...	Nephew and son-in-law.
954	Kaasiyappa 6th, ...	Son-in-law.
964	Dappoola 4th, ...	Son.
964	Dappoola 5th, ...	Not specified.
974	Udaya 3rd, ...	Brother.
977	Sena 2nd, ...	Not specified.
986	Udaya 4th, ...	Do. do.
994	Sena 3rd, ...	Do. do.
997	Mihindoo 3rd, ...	Not specified.
1013	Sena 4th, ...	Son—minor.
1023	Mihindoo 4th, ...	Brother—carried captive to India during the Soleean conquest.
1059	Interregnum, ...	Soleean vice-royalty.
1071	Wejayabahoo 1st, or Sirisangabo 4th, ...	Grandson of Mihindoo 4th.
1126	Jayabahoo 1st, ... Wikramabahoo 1st, ...	Brother.
1127	Gajaabahoo 2nd, ...	A disputed succession.
1153	Prakramabahoo 1st, ...	Son of Maanaabarana.
1186	Wijayabahoo 2nd, ...	Nephew—murdered.
1187	Mihindo 5th, or Kitsen Kisdaas,	Usurper—put to death.
1187	Kirti Nissanga, ...	A prince of Kaalinga.
1196	Werabahoo, ...	Son—put to death.
1196	Wikramabahoo 2nd, ...	Brother of Kirti Nissanga—put to death.
1196	Chondakanga, ...	Nephew—deposed.
1197	Leelawati, ...	Widow of Prakramabahoo—deposed.
1200	Saahasamallawa, ...	Okaaka branch—deposed.
1202	Kalyaanawati, ...	Sister of Kirti Nissanga.
1208	Dharmaasooka, ...	Not specified—a minor.
1209	Nayaanga or Nikanga, ...	Minister—put to death.
1209	Leelawati, ...	Restored, and again deposed.
1210	Lokaiswera 1st, ...	Usurper—deposed.
1211	Leelawati, ...	Again restored and deposed a third time.
1211	Pandi Prakrama Bahoo 2nd,	Usurper—deposed.
1214	Maagha, ...	Foreign usurper.
1235	Wejayabahoo 3rd, (cap. *Dambadinia,*)	Descendant of Sirisangabo 1st.
1266	Kalikaala Sahitya Sargwajnya, or Paandita Prakrama Bahoo 3rd, ...	Son.
1301	Bosat Wejaya Bahoo 4th, ...	Son.
1303	Bhuwaneka Bahoo 1st, ...	Brother.
1314	Prakrama Bahoo 3rd, ...	Son of Bosat Wejayabahoo.
1319	Bhuwaneka Bahoo 2nd, (at *Hastisailapura,*)	Son of Bhuwenekabahoo.
	Pandita Prakrama Bahoo 4th,	Not specified.
	Wanny Bhuwaneka Bahoo 3rd,	
	Wejaya Bahoo 5th, ...	
1347	Bhuwaneka Bahoo 4th, (at *Gampala,*)	
1361	Prakrama Bahoo 5th, ...	

1371	Wikram Bahoo 3rd, (at *Kandy,)*	Cousin.
1378	Bhuwaneka Bahoo 5th, ...	Not specified.
1398	Wejaya Bahoo 5th, or Weera Bahoo, ...	Not specified.
1410	Siri Prakrama Bahoo 6th, (at *Kotta,)*.....	Not specified.
1462	Jayaa Bahoo 2nd, ...	Maternal grandson—put to death.
1464	Bhuwaneka Bahoo 6th,..	Not specified.
1471	Pandita Prakrama Bahoo 7th,	Adopted son.
1485	Wira Prakrama Bahoo 8th, ..	Brother of Bhuwaneka Bahoo 6th.
1505	Dharma Prakrama Bahoo 9th,	Son.
1527	Wejaya Bahoo 7th, ...	Brother—murdered.
1534	Bhuwaneka Bahoo 7th, ...	Son.
1542	Don Juan Dharmapaala, ...	Grandson.
	A *Malabar*, at *Yapahoo.*	
	Portuguese, at *Colombo.*	
	Weediye Raja, at *Pailainda Nowera.*	
	Raajasingha, at *Aiwissawelle.*	
	Idirimaaney Suriya, at *Seven Korles.*	
	Wikrama Bahoo, at *Kandy.*	
1581	Raajasingha 1st, ...	Son of Maayaadunnai.
1592	Wimala Dharma,.....	Original royal family.
1604	Senaaratena, or Senerat, ...	Brother.
1635	Raajasingha 2nd, ...	Son.
	Koomaara-singa,..	*Brother.*
	Wijaya Paala,.....	*Brother.*
1685	Wimala Dharma Suriya 2nd,..	Son of Raajasingha.
1707	Sriwira Prakrama Narendrasingha, or Koondasaala, ..	Son.
1739	Sriwejaya Raajasingha, or Hanguranketta,.....	Brother-in-law.
1747	Kirtisri Raajasingha, ...	Brother-in-law.
1781	Raajaadhi Raajasingha, ...	Brother.
1798	Sree Vikrama Raajasingha, ..	Son of the late king's wife's sister, deposed by the English, and died in captivity.

In the native mode of recording the lengths of individual reigns, without referring them to a fixed epoch, anachronisms are unavoidable: Mr. TURNOUR has judiciously applied the following fixed points to correct the foregoing table.

B. C.	543	The landing of Vijaya, *in the year of Buddha's death.*
	307	The Mission from Dharmásoka to establish Buddhism in Ceylon.
	104	The conquest of Ceylon by the Malabars.
	90	The founding of *Abhayagiri* by Wala gaurbahu.
A. D.	209	The date of the Vaitúliya heresy, in Vaivahara's reign.
	252	The revival of ditto, in the reign of Golú Abhaa.
	301	Death of Makasen, 4 years anachronism.
	545	Another revival of the Vaitúliya heresy, in Ambakaira's reign.
	838	Origin of the Vijra waadiya heresy, in Mitwella Sén's reign.
	1153	The accession of Prákrama Báhú, 6 years anachr.
	1200	Ditto of Sahasa Mallawa, by Dambulla rock inscription, A. B. 1473.
	1266	Ditto of Panditta Prákrama Báhú 3rd, error 7 years.
	1347	Ditto of Bhuwaníka Báhú 4th.

In the remaining portion of the history of Ceylon, other materials have not been wanting for the adjustment of its Chronology.

Table LIX. Greek Dynasties in Asia, *founded after the death of Alexander the Great, by his generals, &c.*

B. C.
334 Alexander the Great; born 356: died 323.

Syria.

B. C.
310 Seleucus I. Nicanor.
281 Antiochus I. Soter.
259 Antiochus II. Theos.
244 Seleucus II. Callinicus.
226 Seleucus III. Ceraunus.
222 Antiochus III. Magnus.
Achæus.
187 Seleucus IV. Philopator.
174 Antiochus IV. Epiphanes.
164 Antiochus V. Eupator.
162 Demetrius I. Soter.
150 Alexander I. Bala.
145 Demetrius II. Nicator.
144 Antiochus VI. Theos.
144 Tryphon.
140 Antiochus VII. Sidetes.
127 Alexander II.
121 Seleucus V.
120 Antiochus VIII. Gryphus.
112 Antiochus IX. Cyzicenicus.
94 Seleucus VI.
93 Antiochus X. Eusebes.
92 Antiochus XI.
91 Philip, and
90 Demetrius III. Euchares.
85 Antiochus XII. (Dionysius of Josephus.)
81 Tigranes, of Armenia.
61 Antiochus XIII. Asiaticus.
Syria became a Roman province.

Asia Minor.

B. C.
309 Antigonus.
298 Demetrius Poliorcetes.

Parthia.

B. C.
253 Arsaces I.
233 Tiridates*.
196 Artabanes.
Phriadatius.
Phrahates.
Mithradates.
Phrahates II.
Artabanes II.
Mithradates II.
Mnaskires.
Sinatroces.
Phrahates III.
Mithradates III.
Orodes.
22 Phrahates IV.
Phrahataces.
Orodes II.
Vonones I.
Artabanes III.
Gotarces.
Bardanus.
A. D. Vonones II.
52 Vologeses.
99 Pacorus.
118 Chosroes.
160 Moneses.
167 Vologeses II.
195 Vologeses III.
215 Artabanes IV.
235 Artaxerxes, King of Persia, 1st of the Sassanidæ. See Table LXVIII.

Known Kings of Bactria.

B. C.
255 Theodotus I.
243 Theodotus II.
220 Euthydemus, of Magnesia.
195 Apollodotus.
Menander, king of India.
Heliocles. (?)
Demetrius, son of Euth.
181 Eucratides the Great.
146 Eucratides II.
125 Destruction of the Bactrian Empire by the Tartars and Scythians.

New names discovered on Greek coins dug up in the Panjáb, connecting the Bactrian with the Hindu dynasties.

Agathocles.
Pantaleôn.
Diomedes.
Antilakides.
Lysius.
Philoxenus.
Antimachus.
Nonus.
Mayus.
Kodus.
Azus.
Azilisus.
Hermæus.
Unadpherrus.
Kadaphes Choranus.
Oohemo Kadphises.
Rao Kanerkos.
Rao nanorao oerki korano, (the series here falls into the Canouj group.) See Table XXIX.

* The family name Arsaces is applied to all the princes of Parthia, hence called the *Arsacidæ*, and is almost the only one visible on their coins: their titles are *megas, dikaios, euergetes, epiphanes, zenios, theos, nikator, philellenos, theopator, &c.*

Table LX. *Mythological period of Persian history.*

Peshdádian dynasty.

Kaiumars, by some supposed Adam, or Noah, reigned at *Balkh.*
Siamek, his son.
Hoshang.
Thamurath, surnamed Deoband.
Jamshíd, reigned at Persepolis.
Zohák, surnamed Alvani, an invader.
Feridûn, restored by Kawa the blacksmith.
Iráj.
Koshang.
Manuchehr.
Naudar.
Afrasiáb, king of Turkistán.
Zab, brother of Naudar.
Ghorshasp.

Kaianian dynasty.

Kai-kobad, *(kai* signifies the mighty.)
Kai-Kavus, son or grandson. Rustem his general.
Kai-Khôsru, grandson. Cyrus the great.
Loharasp, son of Orond Sháh. (Cambyses omitted ?)
Gushtasp, his son. Hystaspes of Grecian history.
Isfendiar, his son. Apanda or Astyages of do.
Kai Bahman, or Ardeshír darázdast. Artaxerxes Longimanus.
Homai, daughter and wife of do.
Darab, son of do.
Dara, his son: the Darius overcome by Alexander the Great.

[The *Muluk-tawáif*, or Petty kings, following Alexander, called by the Persians the *Ashkanians* and *Ashghanians*, have been given above as the Arsacidæ of the Greeks.]

Table LXI. Kings of Persia, *of the Sassanian race.*

A. D.		
223	1	Ardeshîr-Babegân ben Sâsân, or Artaxerxes.
238	2	Shahpûhr, Shapûr, or Sapor, captured Valerian.
271	3	Hormuzd or Hormisdas.
273	4	Baharâm or Varanes.
279	5	Baharâm or Varanes II.
296	6	Baharâm or Varanes III.
297	7	Narsê or Narses, conquered Armenia and Galerius.
303	8	Hormuzd or Hormisdas II.
310	9	Shahpûhr or Sapor II.
380	10	Ardeshîr or Artaxerxes II.
384	11	Shahpûhr or Sapor III.
389	12	Baharâm or Varanes IV.
399	13	Yezdegird or Isdegerde.
420	14	Baharâm-gaur or Varanes V. visited India.
440	15	Yezdegird or Isdegerde II.
457	16	Hormuzd or Hormisdas III.
457	17	Fîrûz or Perose, allied with Khakan of Huns.
488	18	Balâs, Palash, or Balasces.
491	19	Kobâd or Cavades.
498	20	Jamasp.
531	21	Khosrû, Kesrî, (Nushirvan,) or Chosroes.
579	22	Hormuzd or Hormisdas IV. deposed by his general.
589	23	Khosrû-Parvîz, Kesrî, or Chosroes II. put to death by
628	24	Kobâd-Shîrûyieh or Siroes.
629	25	Ardeshîr III. or Adeser. Anarchy.
629	26	Shahriâr or Sarbazas.
629	27	Purân-Dokht.

A. D.		
631	28	Azermi-Dokht.
631	29	Ferokh-zad-Bakhtyar.
632	30	Yezdegird or Isdegerde III, overthrown by Musulmáns 641.

TABLE LXII. KHALIFS, *vicegerents or successors of* MAHOMED *or* MUHAMMED BEN ABD-ALLAH, *whose death occurred in the 11th of Hejra era, or A. D.* 632.

[This and the following from Marsden's Numismata Orientalia.]

A. H.	A. D.		
11	632	1	Abubekr.
13	634	2	Omar.
23	644	3	Othmán.
35	656	4	Alí.
40	661	5	Hasan ben Alí, retired at Medina—Hosein killed at Kerbela.
			Race of Ommiah, reigning at Damascus.
41	661	1	Muáwíah.
60	680	2	Yezíd ben Muáwíah.
64	684	3	Muáwíah II. ben Yezíd.
64	684	4	Abdallah ben Zobeir.
84	684	5	Merwán ben Hul-akem.
65	684	6	Abd-ul-malek ben Merwan.
86	705	7	Walíd ben Abd-ul-malek.
96	714	8	Soleímán ben Abd-ul-malek.
99	717	9	Omar ben Abd-ul-azíz.
101	720	10	Yezíd II. ben Abd-ul-malek.
105	724	11	Heshám ben Abd-ul-malek.
125	743	12	Walíd II. ben Yezíd.
126	744	13	Yezíd III. ben Walíd.
126	744	14	Ibráhím ben Walíd.
127	744	15	Merwán II. ben Muhammed, deposed and slain.
			Race of Al-Abbás, reigning at Baghdád.
132	750	1	Abúl Abbás al-saffáh.
136	754	2	Almansúr.
158	775	3	Al-Mahdí ben al-Mansúr.
169	785	4	Al-Hádí ben al-Mahdí.
170	786	5	Harún al-Rashíd ben al-Mahdí.
193	809	6	Al-Amín ben al-Rashíd.
198	813	7	Al-Mámun ben al-Rashíd.
			Ibráhím ben al-Mahdí, competitor, 817—818.
218	833	8	Al-Mòtasem billah ben al-Rashíd.
227	842	9	Al-Wáthek-billah ben al-Mòtasem.
232	847	10	Al-Motawakkel ala'llah ben Mòtasem.
247	861	11	All-Mostanser billah ben Motawakkel.
248	862	12	Al-Mostàin billah ben Muhammed ben Mòtasem.
252	866	13	Al-Mòtaz billah ben Motawakkel.
255	869	14	Al-Mohtadí billah ben Wáthek.
256	870	15	Al-Mòtamed ala'llah ben Motawakkel, Egypt independent. Muwaffek billah, his coadjutor, from 871 to 891.
279	892	16	Al-Mòtadhed billah ben Muwaffek.
289	902	17	Al-Moktafi billah ben Mòtadhed; provinces independent.
295	908	18	Al-Moktader billah ben Mòtadhed, murdered by a eunuch.
320	932	19	Al-Káher billah ben Mòtadhed.
322	934	20	Al-Radhí billah ben Moktader. Amír ul omra powerful.
329	940	21	Al-Motakí billah ben Moktader.
333	944	22	Al-Mostakfi billah ben Motakí.
334	946	23	Al-Motí lillah ben Moktader.
363	974	24	Al-Taí billah ben Motí.
381	991	25	Al-Káder billah ben Ishak ben Moktader.
422	1031	26	Al-Káim beamrillah Abú Jáfar Abd-Allah ben Káder.
467	1075	27	Al-Moktadí billah Abu'l Kasem Abdallah ben Muhammed ben Káim.

487	1094	28	Al-Mostadher billah ben Moktadí.
512	1118	29	Al-Mostarshed billah ben Mostadher.
529	1135	30	Al-Ráshed billah ben Mostarshed.
530	1136	31	Al-Moktafi beamrillah ben Mostadher.
555	1160	32	Al-Mostanjed billah ben Moktafi.
566	1170	33	Al-Mostadhi beamrillah ben Mostanjed.
575	1180	34	Al-Násar aldín illah ben Mostanjed, professes Shía doctrines.
622	1225	35	Al-Dháher beamrillah Muhammed ben Náser.
623	1226	36	Al-Mostanser billah Abú Jáfar Al-Mansúr ben Dháher.
640	1242	37	Al-Mostásem billah Abú Ahmed Abd-Allah ben Mostanser.

In the year 656, (1258,) *Baghdád* was besieged and taken by the Moghul Chief Hula'gu, grandson of Jenghiz Kha'n, and the Khálif Mostasen put to death.

Table LXIII. Samanian or Sama'ni' *Dynasty, of Bokhárá, Khorásán and* Persia.

A. H.	A. D.	
261	874	Nasr ben Ahmed, great grandson of Sámán, a robber chief, appointed governor of *Bokhára* by the Khálif Mòtamed.
279	892	Ismáíl ben Ahmed.
295	907	Ahmed ben Ismáíl.
301	913	Nasr ben Ahmed.
331	943	Nûh ben Nasr.
343	954	Abd-ul-malek ben Nûh,
350	961	Al-Mansúr ben Nûh.
366	977	Nûh ben Al-Mansúr.
387	997	Al-Mansûr ben Nûh, deposed and blinded.
389	998	Abd-ul-malek ben Nûh, overturned by the *Ghaznavis*.

Table LXIV. Ghaznevide *Dynasty of* Persia *and* India, *including Khorásán, Maver-ul-nahr, Bokhárá, &c. Capital Ghazní.*

A. H.	A. D.	
365	975	Sabactagin, a Turkish slave of Alpteghin, a general in the service of Sultán Nûh of the Samanides, held government of *Ghazní*, and Khorásán.
387	997	Ismael appointed successor, but displaced by
387	997	Sultán yemin ud-daulat abul kasim Mahmud.
421	1030	Muhammed, his son, deposed instantly.
421	1030	Masaud, another son, deposed and killed.
432	1041	Muhammed, restored, and again deposed.
433	1042	Maudud, son of Masaud.
440	1048	Shams ud-din allah Saif ud-daulah, Abdurrashid.
444	1052	Ferokhzad, son of Masaud.
451	1059	Malek Mouiád Ibra'him.
481	1088	Julal ud-din Masaud, or Abusaid.
508	1115	Arslan Sháh.
512	1118	Bahram Sháh.
548	1153	Nizàm ud-din Khosru Sháh.
579	1183	*Ghazní* taken by Shaháb ud-din, and the *Ghorí* dynasty established. *(See Tab.* LXXII.*)*

Table LXV. Sulta'ns *of the* Selju'k Dynasty.

[The grandsons of Selju'k, a Turk of the tribe of *Khazar* or *Ghaz* on the Caspian, Toghrul-beg and Jáfer-beg Daoúd, were in the service of Mahmúd of *Ghazní*. In A. H. 429 (1036), the former resisted Masáud, and received investiture as Sultán of Khorasán from the Khálif. The three branches of the Seljúk family settled in *Hamadán*, *Kermán*, and *Rum* or Anatolia.—Marsden's Or. Num.]

I. *Seljuk dynasty of Irán or Persia.*

A. H.	A. D.	
429	1037	Rokn ud-dín Abuthaleb, Toghrel begh, Mahmúd.
455	1063	Alp Arslan, Abushajia Azz ud-din.

465	1072	Malekshah, Moaz ud-dín abul fateh.
485	1092	Barkiarok, rokn ud-dín abulmozaffer kásim : in his reign the empire was divided, he retaining *Persia ;* Ghiás ud-dín Muhammed, *Syria* and *Aderbiján ;* and Moaz ud-dín burhán sanjiár, *Khorásán* and *Maverulnahr.*
498	1104	Malek Shah, his son, deposed.
498	1105	Muhammed, chosen Sultan.
511	1118	Mahmud, Moghiáth ud-dín Abul Cásem.
525	1131	Daoud, his son, deposed.
526	1131	Masaud, Ghiath ud-dín, deposed.
527	1132	Toghrel, son of Muhammed.
529	1134	Masaud, re-established.
547	1152	Malek Sháh, son of Mahmud, deposed.
547	1152	Mahmud, grandson of Bograkhán, at *Merv.*
552	1157	Muhammed, his son, at *Hamadán.*
554	1159	Suleimán Sháh, killed.
555	1160	Arslán Shah, son of Toghrel, son of Muhammed.
571	1175	Toghrel Sháh, his son.

II. *Seljuk dynasty of Kermán.*

433	1041	Kadherd, or Karut begh, installed by Toghrel begh.
465	1072	Sultan Sháh, his son.
467	1074	Turán Sháh.
489	1096	Iran Sháh.
494	1100	Arslán Sháh.
536	1141	Moghiath ud-din Muhammed.
551	1156	Toghrel Shah.
565	1169	Bahrám, Arslán, and Turán Sháh dispute succession.
——	——	Muhammed Sháh, dispossessed by Malek dinar 583-1187.

III. *Seljuk dynasty of Rúm or Anatolia. Capital Iconium.*

A. H.	A. D.	
470	1077	Suleimán ben Kotlumish.
478	1085	Interregnum of seven years.
485	1092	Daoúd Kilij Arslán ben Suleimán.
501	1107	Saisan ben Kilij Arslán.
510	1116	Masáud ben Kilij Arslán.
551	1156	Azz-ud-dín Kilij Arslán ben Masáud, destroyed 1st crusade army.
584	1188	Kotb-ud-dín Malek Shah ben Kilij Arslán, deposed.
588	1192	Ghiás-ud-dín Kai Khosru ben Kilij Arslán, deposed.
596?		Rukn-ud-dín Suleimán ben Kilij Arslán, deposed.
600	1203	Kilij Arslán ben Rukn-ud-dín, deposed.
600	1203	Ghias-ud-dín Kai Khosru, (restored.)
607	1210	Azz-ud-dín Kai Káns ben Kai Khosru.
616	1219	Ala-ud-dín Kai Kobád ben Kai Khosru.
634	1236	Ghiás-ud-dín Kai Khosru ben Kai Kobád, invaded by the Moghul Princes, descendants of Jenghiz Khán *(See Tab. .)*
643	1245	Azz-ud-dín Kai Káus, in nominal conjunction with his brothers, Rukn-ud-dín and Ala-ud-dín, sons of Kai Khosru.
655	1257	Rukn-ud-dín Kilij Arslán.
666	1267	Ghiás-ud-dín Kai Khosru ben Rukn-ud-dín.
682	1283	Masáud ben Azz-ud-dín Kai Káus, died 708—1308.

Table LXVI. Atabegs *of* Ira'k, *ruling Ministers under the latter Princes of the Seljukian race.*

Mosul Branch.

A. H.	A. D.	
521	1127	Imád ud-dín Zengi.
540	1145	Seif ud-dín Ghází ben Zengi.
544	1149	Kotb ud-din Maudud ben Zengi.
565	1170	Al-Moaz Seif ud-dín Ghází ben Maudud.
576	1180	Azz ud-dín Masáud ben Maudud.

589	1193	Núr ud-dín (Bedrud-dín) Arslán Shah ben Masáud.
607	1210	Malek al-Káher Azz ud-dín Masáud ben Núr ud-dín.
615	1218	Núr ud-dín Arslán Sháh ben Káher.
616	1219	Násar ud-dín Mahmúd ben Káher.
619	1222	Al-Malek al-Rahím Bedr ud-dín Lúlú.
657	1259	Al-Malek as-Sálah Ismáil ben Lúlú.

Haleb (Aleppo) Branch.

521	1127	Imád ud-dín Zengi.
540	1145	Malek al-Adel Núr ud-dín Mahmúd ben Zengi.
569	1174	Al-Malek as-Sálah Ismáil ben Núr ud-dín Mahmúd.
577	1181	Imád ud-dín Zengi ben Kotb ud-dín ben Maudud, delivered *Haleb* to Sálah ud-dín or Saladin.
594	1197	Kotb ud-dín Muhammed ben Imád ud-dín, at *Singára*.

Table LXVII. Turcoman Ortokite Princes, *reigning in Mardin and Miafarkin, Syria.*

		Il Ghází ben Ortok, seized Jerusalem and Mardín.
516	1122	Husám-ud-dín Timurtásh ben ul Ghází.
547	1152	Nejm-ud-dín Abu'l Modhaffer Albi ben Timurtásh.
572	1176	Kotb-ud-dín Il Ghází ben Albi (or Alpi).
580	1184	Husám-ud-dín Yúluk Arslán ben Kotb-ud-dín.
597?		Malek-ul-Mansúr Náser-ud-dín Ortok Arslán ben Kotb-ud-dín.
637	1239	Malek us-Said Najm-ud-dín Ghází ben Náser-ud-dín Ortok.
653	1255	Malek ul-Modhaffer Kará Arslán ben Nejm-ud-dín.
691	1291	Shams-ud-dín Dáoud.
693	1293	Malek ul Mansúr Najm-ud-dín Ghází.
712	1312	Albi Malek al-Adíl Imád-ud-dín Alí.
712	1312	Malek as-Sáleh Shams-ud-dín Sálah.

Ortokites *reigning at A'mid and Kheifa.*

A. H.	A. D.	
490	1097	Sokmán ben Ortok.
498	1104	Ibráhím ben Sokmán.
522?	1128	Rukn ud-dín Dáoud.
544?		Fakhr ud-dín Kará Arslán ben Dáoud.
562	1166	Núr ud-dín Muhammed ben Kará Arslán.
581	1185	Kotb ud-dín Sokmán ben Muhammed.
597	1200	Malek as-Sálah Náser ud-dín Mahmúd.
618	1221	Malek al-Masáud ben Malik as-Sálah Mahmúd.
629	1231	Melek al-Kámel, nephew of Sálah ud-dín, (Saladin,) took *A'mid*.

Table LXVIII. *The* Mogol *or* Moghel *empire of* Tartary. *Capital Karakurm.*

A. D.	
1206	Jenghiz Kha'n, or Timugin declared emperor, on the *Onon* river.
1227	Tuli Khán, his son, regent during interregnum.
1241	Oktai Khán, son of Jenghiz.
	Tourakina Khatun, his wife, regent for 4 years.
1246	Gaiuk Khán, son of Oktai.
1248	Ogoulganmish, his wife, regent on his death.
1251	Mangu Khán, died in 1259.

The Empire of the Mogols was subsequently divided into different branches, in China, Persia, in Kapchak, &c.

1260	Kublai Khán, succeeded in China, and founded the Yuen dynasty.
1240	Zagatai Khán, son of Jenghiz, founded Zagatai branch in Transoxiana.
1226	Tushi Khán, another son, founded Kapchak dynasty.

[For these dynasties of the Tartars; and those of the Huns, Chinese, &c. see De Guignes' *Histoire des Huns.*]

Table LXIX. Moghel-Tartar *or* Il-Khanian *Dynasty of* Persia.

On the death of Mangu Kha'n son of Jenghíz Kha'n, the sovereignty of Persia was assumed by his brother

A. H.	A. D.	
657	1259	Hulágu or Haláku Il-Khán.
663	1264	Abága or Abáka Il-Khán, his son.
681	1282	Nikudar Oglan, 7th son of Huláku, on conversion to Muhamedanism, took the name of Ahmed Khán.
683	1284	Arghún Kaan, son of Abága.
690	1291	Kai-Khatu Kaan, ditto.
694	1294	Baídu Kaan, son of Targhih, 5th son of Huláku.
694	1294	Gházán Kaan Mahmúd, eldest son of Arghún.
703	1303	Ghiás-ud-dín Au-gaptu, Khoda bandah Muhammed.
716	1316	Abu Sáid Bahádur Khán, his son, on whose death in
736	1335	the dynasty became dependent.
747	1346	Anúshirván. Invasion of Taimúr or Tamerlane. (See below.)

Table LXX. Moghel *Sultáns of* Khora'sa'n.

795	1393	Kutb-ud-dîn Ami'r Timu'r Gúrgán Sáhibkiran (Tamerlane) conquered Baghdád, invaded India, &c.
807	1404	Khalíl Sultán, son of Míran Sháh, deposed.
——	——	Sháh Rokh, behadur Sultán.
850	1447	Ulugh Begh, Malak us said, of Khiva.
853	1449	Abdul Latif Mírza, his son.
854	1450	Baber Mírza, Sultán Abul Casem.
861	1456	Mîrza Sháh Mahmud, deposed.
861	1456	Abu Said, son of Ahmed. *(See Moghels of India.)*
——	——	Jiadighiar, grandson of Sháh Rokh.
805	1470	Sultán Hosein Mírza, grandson of Omar.
901	1505	Badi ezzaman, his son, took refuge with the Sufis.

Table LXXI. Kings *of* Persia *of the Sophi, Súfí, or Safi Race.*

Juneid, a descendant of Safi ud-din, a Sophi or mystic philosopher, being expelled from *Aderbiján* by the Turcoman ruler Jehan Sháh, established himself in *Shirwán*. His grandson

A. H.	A. D.	
905	1499	Ismáíl al-Sûfî ben Sheikh Haidar, united conquered provinces and assumed sovereignty of Persia and Khorásán 908-1502.
932	1525	Shâh Tahmâsp ben Ismáíl.
983	1575	Shâh Ismáíl II. ben Tahmâsp.
985	1577	Muhammed Khodabandah ben Tahmâsp.
994	1585	Hamzah ben Muhammed, or Amîr Hams.
994	1585	Shâh Ismáíl ben Muhammed.
994	1585	Shâh Abbâs ben Muhammed.
1039	1629	Shâh Safí ben Safî Mírza ben Abbas.
1052	1642	Shâh Abbâs II. ben Shâh Safí.
1077	1666	Soleimân ben Shâh Abbâs.
1106	1694	Shâh Husein ben Soleimân, last of the Sufis.
		Shâh Tahmâsp II. ben Shâh Husein, abdicated.
1135	1722	Mahmúd, an Afghân, invaded Persia, and usurped.
1137	1725	Ashraf, an Afghân, defeated by Nadir kulí.
1242	1730	Shâh Tahmâsp, nominally restored, murdered 1737.
1145	1732	Abbâs III. ben Tahmâsp.
1148	1736	Na'dir Shah or Nâdir Sultân, proclaimed king.
1160	1747	Adel Shâh, nephew and murderer of Nadir.
1161	1748	Ibrâhîm, his brother.
1163	1749	Shâh Rokh, blinded, driven to Khorásán.
1163	1750	Soleimân, or Mirza Seid Muhammed.

1163	1750	Ismâíl ben Syed Mustafa, uuder regency of Ali Merdan.
1173	1759	Muhammed Kerîm Khân Zendi, held power under title of Wakil.
1193	1779	Zeki Khân, usurped on his death, murdered by
1193	1779	Abú'l Fatha Khán, son of Kerim, blinded.
1193	1779	Sâdik Khân, brother of do.
		Ali Murâd Khân assumed title of Wakil.
1199	1785	Jáfar Khân, son of Sadik, murdered.
1203	1789	Lutf Ali, his son, defeated by
1209	1794	A'ghá Muhammed Khán Kâjâr, an eunuch.
1211	1797	Fat-ha Ali Shâh Kâjâr, died 1834.

TABLE LXXII. PATAN, *Afghan or Ghorí* SULTANS *of* HINDUSTAN. *Capital Dehli.*

A. H.	A. D.	
588	1192	Shahab ed-dîn Abu'l-Mazaffer Muhammed ben Sâm al-Ghôri, malek Ghiznih.
602	1206	Kotb ed-dîn Ibek or Eibek. *(1st Turk dynasty.)*
607	1210	Arâm Shah ben Ibek.
607	1210	Shems ed-dîn Altemsh, a slave of Ibek.
633	1235	Rukn ed-dîn Firûz Shâh ben Altemsh.
634	1236	Sultâneh Rezîah benet Altemsh.
637	1239	Mòazz ed-dîn Bîram Shâh ben Iltemsh.
640	1242	Alâ ed-dîn *Masùûd* Shâh ben Firûz Shâh.
643	1245	Nâser ed-dîn *Mahmúd* ben Iltemsh.
664	1265	Ghiâs ed-dîn *Balin* Balban.
685	1286	Mòazz ed-dîn Kai-Kobad.
688	1289	Jelâl ed-dîn *Fírûz Sháh* Khilji. (*2nd Turk, or Khilji.*)
695	1295	Alâ ed-dîn MUHAMMED SHAH Sekander Sânî.
716	1316	Shahâb ed-dîn Omar ben Alâ ed-din.
717	1317	Kotb ed-dîn Mubârik Shah Khilji, murdered by
		Nâser ed-dîn Khosru, usurper.
721	1321	Ghiâs ed-dîn TUGHLAK SHAH. (*3rd Turk dynasty.*)
725	1324	Muhammed Shah ben Tughlak.
752	1351	Moâzem Mohedzeb Firûz Shâh ben Sâlâr Rajab.
790	1388	Ghias ed-dîn Tughlak Shâh II. ben Fat-ha Khân.
791	1389	Abu-bekr Shâh ben Ziffer Khân.
793	1391	Nâser ed-dîn Muhammed Shâh ben Firûz Shâh.
796	1393	Alâ ed-dîn Sekander Shâh Humâyûn ben Muhammed Shâh.
796	1393	Nâser ed-dîn Mahmûd Shâh ben Muhammed Shâh, overcome by
816	1413	Daulat Khân Lôdî, a Patan. [Taimur Shâh; last of Khiljis.
817	1414	Kîser or Khizer Khân ben Solîmân, under Taimur. (*4th or Sadat.*)
824	1421	Mòazz ed-dîn Abu'l Fat-ha Mubârik Shâh ben Khizer.
837	1433	Muhammed Shâh ben Ferîd Khân ben Khizer Khan.
850	1446	Alâ ed-dín ben Muhammed Shâh, abdicated in favor of
854	1450	Behlôli Lôdî, an Afghan. (*5th or 1st Afghan dynasty.*)
894	1488	Sekander ben Behlôli, made Agra the capital.
923	1517	Ibrâhîm ben Sekander, last of the Afghans; defeated by Baber, 942.
947	1540	Ferîd ed-dîn SHIR SHAH, expelled Humáyun (see Table LXXX.)
952	1545	Islâm Shâh ben Shîr Shâh.
960	1552	Muhammed Adil Shâh.
961	1553	Ibrâhîm Sûr.
962	1554	Sekander Shâh, defeated by AKBER.

TABLE LXXIII. PATAN *or Afghan Sultans and Governors of* BENGAL. *(Purbí dynasty.) Capital Laknauti or Gaur.*

A. H.	A. D.	
600	1203	Muhammed Bakhtiâr Khilji, governor of Berar under Kutb ud-din.
602	1205	Muhammed Sherân Azz ed-din.
605	1208	Ali Merdân Ala ed-din.
609	1212	Hasám ed-din Ghiás ed-din.

624	1226-27	Naser ed-din ben Shems ed-din.
627	1229	Mahmud ben Shems ed-din, became Sultan of Hindustán.
634	1237	Toghan Khan, governor under Sultana Rizia.
641	1243	Tiji or Taji.
642	1244	Tîmûr Khan Kerân.
644	1246	Seif ed-din.
651	1253	Ikhtiâr ed-din Malek Yuzbeg.
656	1257	Jelal ed-din Kháni.
657	1258	Taj ed-din Arslan.
659	1260	Muhammed Tatar Khán.
676	1277	Mòazz ed-din Toghrul.
681	1282	Naser ed-din Baghra (by Dow written Kera), considered 1st sovereign
725	1325	Kader Khan, viceroy of Muhammed Shâh. [of Bengal, by some.
741	1340	Fakhar ed-din Sekander, assumes independence.
743	1342	Ala ed-din Mubarik.
744	1343	Shems ed-din Muhammed Shâh Ilias Bangarah.
760	1358	Sekander Shâh ben Shems ed-din.
769	1367	Ghias ed-din Azem Shâh ben Sekander Shâh.
775	1373	Seif ed-din Sultan as-Sulatîn ben Ghias ed-din.
785	1383	Shems ed-dîn ben Sultan as-Sulatîn.
787	1385	Kansa or Khansa, a Hindu.
794	1392	Jelal ed-din Muhammed Shâh (Chitmul ben Khansa).
812	1409	Ahmed Shâh ben Jelal ed din.
830	1426-7	Naser Shâh (descendant of Shems ed-din Ilias Bangarah).
862	1457	Barbek Shâh ben Naser Shâh.
879	1474	Yusuf Shâh ben Barbek Shâh.
887	1482	Sekander Shâh.
887	1482	Fat-ah Shâh.
896	1490-1	Shah-zadah, an eunuch.
897	1491	Firuz Shâh Habshî.
899	1494	Mahmud Shâh ben Firuz Shâh.
900	1495	Mozaffer Shâh Habshî.
903	1498	Ala ed-din Husen Shâh ben Syed Ashraf.
927	1521	Nasret Shâh ben Ala ed-din Husein.
940	1534	Mahmud Shâh ben Ala ed-din Husen, defeated by
944	1537	Firid ed-din SHIR SHAH.
945	1538	Humayun held court at Gaur, or *Jenatábád.*
946	1539	Shir Shâh again.
952	1545	Muhammed Khan.
962	1555	Khizer-Khan Bahadur Shâh ben Muhammed Khan.
968	1560-1	Jelal ed-din ben Muhammed Khan.
971	1563-4	Soleiman Karani or Karzani.
981	1573	Bayazid ben Soleiman.
981	1573	Daud Khan ben Soleiman, defeated by Akber's forces.

TABLE LXXIV. *Kings of the East, or* SHARKI *Dynasty of* JAUNPUR.

A. H.	A. D.	
800	1397	Khoja Jehan, Subahdar of *Kanauj*, *Audh*, *Kora*, and *Jaunpur*, assumed independence.
803	1400	Mubarik Shâh, his adopted son.
804	1401	Shems ud-dîn Ibrahim Shâh Sherkí.
845	1441	Mahmud Shâh ben Ibrahim.
856	1451	Husen Shâh ben Mahmud ben Ibrahim Shâh.
883	1478	——— took refuge in the Court of Ala ud-din of Bengal, where he died in 905 A. H.

TABLE LXXV. MUSALMAN *Kings of* KASHMIR.

A. H.	A. D.	
715	1315	Shams ud-din, Sháh Mir, minister of Senadeva.
750	1349	Jamshid, expelled by his youngest brother.
752	1351	Ally Sher, Alla ud-din ; a severe famine.
765	1363	Shahab ud-din ; Siamuk invades Sind.

785	1386	Kutb ud-din, Hindal ; defeats Rája of Lohkote.
799	1396	Sikandar, Butshikan ; subverts Hindu religion.
819	1416	Ameer Khan, Ally Sháh ; civil wars ; expelled by
826	1422	Zein ul Ab-ud-din, Shády Khan, his brother.
877	1472	Haider Sháh, Hajy Khan.
878	1473	Hasan Sháh.
891	1486	Muhammed, a child ; civil wars.
902	1496	Fatteh Sháh, usurps the throne. Chakk tribe converted to Islám.
911	1505	Muhammed, regains the throne ; Ibrahim usurps.
942	1535	Nazuk Sháh ; conquest of Emperor Humayun, 1543.
948	1541	Mirza Haider Doghlat, governor under him ; interregnum, and dissentions.
960	1552	Ibrahim II., set up by Daulet Chakk : earthquake.
963	1555	Ismael, set up by Ghazi Khan's party.
964	1556	Habíb, raised by Daulet Chakk.
971	1563	Hosein Sháh Chakk : embassy from Akber.
986	1578	Yusuf Sháh Chakk expelled by Gohar Chakk.
997	1588	——- annexation of Kashmir to the Moghel Empire by Akber.

Table LXXVI. Kings *of* Sind *and* Tatta.

A. H.	A. D.	
87	705	*Belochistan* invaded by Hijaj, governor of Bassora, and Md. Kásim.

The *Ansaries*, the *Sumeras*, and the *Sumanas* or *Jams*, successively, gain the ascendancy, then a Delhi governor.

	1203 ?	Nasir ud-din Kabbacha, becomes independent, drowned.

Table LXXVII. *The* Jami *Dynasty of* Sumana, *originally Rájputs.*

A. H.	A. D.	
737	1336	Jám Afra ; tributary to Toghlak Sháh.
740	1339	Jám Choban.
754	1353	Jám Bang ; asserted his independence.
782	1367	Timaji, his brother.
782	1380	Jám Salah ud-din ; converted to Muhammedanism.
793	1391	Jám Nizam ud-din.
796	1393	Jám Ally Sher.
812	1409	Jám Giran, son of Timaji.
812	1409	Jám Fatteh Khan.
827	1423	Jám Toghlak ; invaded Gujerat.
854	1450	Jám Sikandar.
856	1452	Jám Sangar, elected.
864	1460	Jám Nanda, or Nizam ud-din ; cot. of Hasan Langa.
894	1492	Jám Feroz ; the Turkhan family become powerful, 1520.
927	1520	Sháh Beg Arghun, occupies Sind.
930	1523	Sháh Hosein Arghun.
966	1554	Mahmud of Bhakar.
982	1572	Akber *annexes* Sind to the Empire.

Table LXXVIII. *Bahmany Dynasty of Kalbarga, or Ahsunábád.*

A. D.	
1347	Ala ud-din Hasan Shâh ganga Bahmany, servant of a Brahman in Md. Toghlak's court, subdued all the Dakhan.
1358	Mahomed Shâh B. I. (Ghazi), makes tributary Telingana and Vijyanagar.
1375	Mujahid Shâh B., killed by his uncle.
1378	Dawud Shâh B., assassinated by his niece.
1378	Mahmud Shâh I., youngest son of Ala ; patron of literature.
1396	Ghias ud-din ; blinded and dethroned.
1396	Shems ud-din Shâh ; puppet to Lalchin, the Malik Naib or regent.
1397	Feroz Shâh, married daughter of Vijyanagar rája, Deva Ray.
1422	Ahmed Shâh Wali (Khan Khanan) ; war with rájas.

1435 Ala ud-din Shâh II. war with Vijyanagar.
1457 Humayun the cruel; general insurrection.
1461 Nizam Shâh; rájas of Telingana and Orissa powerful.
1463 Mahomed Shâh II.; Malwa power increasing.
1482 Mahmud II.; loses Concan, Bijapur, and Berar.
1518 Ahmed Shâh II.; under control of Amir Berid, minister.
1520 Ala ud-din Shâh III.; deposed by ditto.
1522 Wali Ullah; murdered by ditto.
1525 Kallam Ullah, Bahmany dynasty of Bidar (Ahmedabad) terminates, and is succeeded by that of Amir Berid at Ahmedabad.

Table LXXIX. Berid Shahy *Dynasty of Bider, or* Ahmedabad.

1492 Kasim Berid, a Turki or Georgian slave.
1504 Amir Berid; held sway on the nominal kings.
1549 Ally Berid Shâh; first who assumed royalty.
1562 Ibrahim Berid Shâh.
1569 Kasim Berid Shâh.
1572 Mirza Ally Berid Shâh; deposed by his relative.
1609 Amir Berid Shâh II.

Table LXXX. Faruki *Dynasty of* Kandeish. *Capitals Talner and Burhanpur.*

A. D.
1370 Malik Raja Faruki, receives jagir of Talner, from Feroz.
1399 Malik Nasir or Nasir Khan Faruki, builds *Burhanpur.*
1443 Miran Adil Khan Faruki, expels Deccanies from Kandeish.
1441 Miran Mubarik Khan Faruki; peaceful reign.
1457 Miran Ghani, or Adil Khan Faruki I.; tributary to Guzerat.
1503 Daoud Khan Faruki, tributary to *Malwa.*
1510 Azim Humayun, or Adil Khan F. II.; grandson of Guzerat king.
1520 Miran Muhammed Khan Faruki; succeeds to Guzerat throne.
1535 Miran Mubarik Khan Faruki, brother; war with Moghals.
1566 Miran Muhammed Khan Faruki, attack from Deccan.
1576 Rája Ally Khan Faruki; acknowledges Akber's supremacy.
1596 Bahadur Khan Faruki; defies Akber; is imprisoned at *Gualior.*

Table LXXXI. Kings *of* Malwa. *Capitals D'har, Mando or Shadiábád.*

A. D.
1387 Sultan Diláwar Ghori, governor, assumes title of Sháh, 1401.
1405 Sultan Hoshang Ghori, or Alp Khan, his son, defeats Narsinha Ray.
1432 Ghizni Khan, or Sultan Muhammed Ghori; poisoned.
1435 Mahmud Khan, or Sultan Mahmud Khilji. Rana of Chitor, Kumbho presents tankas coined in his own name, 1450.
1469 Sultan Ghias ud-din; peaceful reign.
1500 Sultan Nasir ud-din; his son, Shahab ud-din, revolts.
1512 Sultan Mahmud II., younger son, last of the Khiljis.
1534 *Malwa* incorporated with Guzerat kingdom.
1568 ——— annexed as a province of Akber's Empire.

Table LXXXII. Kings *of* Guzerat. *Capital Pattan.*

A. D.
1391 Muzaffar Sháh I.; appointed viceroy by Feroz Toghlak.
1411 Ahmed Sháh I., grandson, builds *Ahmedabad* and *Ahmednagar.*
1443 Muhammed Sháh, surnamed *Karím,* the merciful.
1451 Kutb Sháh; opposes Malwa king, and Chitor rája Kombha.
1459 Daoud Sháh, his uncle, deposed in favor of
1459 Mahmud Shâh I. Begarrá; two expeditions to Deccan.
1511 Muzaffar Sháh II.; war with Rana Sangrama.
1526 Sikandar Sháh, assassinated.

1526 Nasir Khan, or Mahmud Sháh II., displaced by
1526 Bahadur Sháh, invades *Malwa*; murdered by Portuguese.
1536 Miran Muhammed Sháh Faruki, his nephew, of Malwa.
1536 Mahmud Sháh, son of Latik Khan; released from prison.
1553 Ahmed Sháh II., a spurious heir set up by minister.
1561 Muzaffar Sháh III. Habbu, a supposititious son of Mahmud.
1583 Guzerat becomes a province of Akber's empire.

Table LXXXIII. Kings *of* Multan.

This province was first conquered by Mahomed Kásim, at the end of the 1st century, Hejira. It was recovered by the Hindus on the decline of the Ghizni power. After Mahomed Ghori's subjugation, it remained tributary to Delhi until

A. H.	A. D.	
847	1443	Shekh Yusuf established an independent monarchy.
849	1445	Ray Sehra, or Kutb ud-din Hosen Langa I.; expelled the Shekh.
908	1502	Mahmud Khan Langa; his minister, Jam Bayezid.
931	1524	Hosen Langa II.; overcome by Sháh Hosen Arghun. Under Humayun, becomes a province of the empire, *(see below.)*

Table LXXXIV. Imád Shahy *Dynasty of* Berar, *capital Ellichpur.*

A. D.	
1484	Fatteh Ullah Imád Shah, Bahmany, governor of Berar, became independent.
——	Alla ud-din Imád Sháh, fixed his capital at *Gával.*
1528?	Daria Imad Sháh, married his daughter to Hosen Nizám Sháh.
——	Burhan Imad Sháh; deposed by his minister.
1568	Tufal Khan, whose usurpation is opposed from Ahmednagar, and the family of Imád Shah and Tufal extinguished.

Table LXXXV. Adil Shahy *Dynasty of* Bi'japur.

A. D.	
1489	Yusuf Khan, son of Amurath II. of Anatolia; purchased for the body guard at Ahmedabad.
1501	—— assumed independent sovereignty as Adil Sha'h.
1511	Ismael Adil Sháh. Goa taken 2nd time by Portuguese.
1534	Mulloo Adil Shah, a profligate, deposed and blinded by
1535	Ibrahim A. S. I. Minister Rámráj assumes throne of *Vijyanagar.*
1557	Ally Adil Sháh; war against the Hindu rája.
1579	Ibrahim Adil Sháh II. Chand beeby regent.
1626	Muhammed.
1660	Ally Adil II.

Table LXXXVI. Nizam Shahy *Dynasty of* Ahmednagar.

A. D.	
1490	Ahmed Nizam Shah, Bheirg, son of a brahman of Vijyanagar; throws off Bahmany yoke.
1508	Burhan Nizam Sháh; petty wars with Berar, &c.
1553	Hosen Nizam Sháh I.; confederacy against Vijyanagar.
1565	Múrteza Nizam Sháh, Diwana, conquers Berar; smothered by
1568	Míran Hosen Nizam Sháh, put to death.
1569	Ismael Nizam Sháh, raised by Jumal Khan Mehdvy.
1589	Burhan Nizam Sháh II.; constructs Korla fort.
1594	Ibrahim Nizam Sháh, killed in battle.
1594	Ahmed, son of Sháh Tahir, raised by chiefs; pensioned.
1595	Bahadur Nizam Sháh, proclaimed by Chand beeby's party; imprisoned by Akber.
1598	Múrteza N. S. II.; Nizam Sháhy dominions fall under the control of
1607	Malik Amber.

Table LXXXVII. Kutb Shahy *Dynasty of* Golconda.

A. D.	
1512	Sultan Kuly Kutb Sháh, a Turkman, assumed title of king.
1543	Jamshid Kutb Sháh, leagues with the Nizam Shahís.
1550	Ibrahim Kutb Sháh, joins league against Rámráj.
1581	Mahomed Kuly Kutb Sháh, builds Bhagnagar, or Hyderabad, died 1586.
1611	Abdallah Kutb Sháh, tributary to Sháh Jehán.
1672	Abu Hasan, imprisoned at Daulatabad.

Under Aurangzeb, the southern conquests were formed into six *Subahs*, viz. 1, Kandeish; 2, Aurangabad; 3, Beder; 4, Berar; 5, Hyderabad; and 6, Bijapur.

Table LXXXVIII. Moghel Emperors *of Hindustán.*

(Fourth descendant from Taimur *or Tamerlane, see Tab.* LXX.*)*

A. H.	A. D.	
899	1494	Baber, Zehir ud-dîn Muhammed, (mounted throne 9th June.)
937	1531	Huma'yun, Nasir ud-dîn Muhammed, (28th Jan.) in 946 defeated by Shír Sháh.
962	1554	————, founded the Moghel dynasty of Dehli.
963	1556	Akber, Abul fateh, Jalal ud-dîn Muhammed, (17th Feb.) consolidated empire.
1014	1605	Jehangir, Abul Muzaffar Nur ud-dîn Muhammed (7th Oct.)
1037	1628	Shahjehan, Shaháb ud-dîn Ghází (9th Feb.)
1068	1658	Aurangzeb A'lamgír, Abul Muzaffar, Mahí ud-dîn, (24th Feb.)
1118	1707	*Azím Sháh*, Muhammed Shahíd, (3rd March.)
1118	1707	Beha'dur Shah, Shah A'lem, Abul Muzaffar Kutb ud-dîn (23rd Feb.)
1124	1713	Jehandar Shah, Mòaz ud-dîn (11th Jan.)
1124	1713	Ferokhsir, Muhammed Shahíd Marhum 11th Jan.)
1131	1719	*Rafi-ud-darjat*, Shams ud-dîn (18th Jan.) (Abú berkat.)
1131	1719	*Rafi-ud-daulat*, Shahjehán Sání (26th April.)
1131	1719	*(Muhammed Nakosir,)* (May.)
1131	1719	Muhammed Sha'h, Abul fateh Násir ud-dîn, (28th Aug.)
1132	1720	*(Sultan Muhammed Ibrahim,)* (4th Oct.)
1161	1749	A'hmed Sha'h, Abúl Nasr. (20th April.)
1167	1754	Alemgir II., Aziz ud-din Muhammed, (2nd June.)
1173	1759	*(Sháhjehán,)* (29th Nov.)
1173	1759	Shah A'lem, Julál ud-dín (Mirza Abdallah, Ali Goher), (Nov.)
1201	1786	*(Muhammed Badar bakht.)*
1221	1806	Akber II., Abul Nasir, Moeín ud-dín Muhammed, (3rd Dec.)

Table LXXXIX. Nizams *of* Hyderabad.

1717	Azef Jáh, Nizám ul Mulk, usurped power on Aurangzeb's death.
1748	Nasir Jang, assassinated.
1757	Muzaffar Jang, ditto. Salabat Jang, killed by
1763	Nizám Alí, his brother.
1803	Sikandar Jâh. English interference, 1807.

Table XC. Nuwábs *and Kings of* Oude.

A. D.	
——	Sádet Alí Khán of *Khorasán*, Nuwáb Vizir, under Muhammed Sháh.
——	Sefdar Jang, ditto.
1756	Shuja ud Dauleh, ditto.
1775	Asef ud Dauleh.
1797	Spurious son, Vizir Alí, displaced for
1798	Sadet Alí, brother of Shuja, Vizir of Hindustán.
1814	Gházi ud-dîn Haidar Alí, Sháh Zeman, king.
1827	Naser ud-dîn Haidar Alí.

Table XCI. *Chronological Table of European and British Connection with India, compiled by Capt. H. B. Henderson.*

1204.—After the capture of Constantinople by the Crusaders, in the 4th Crusade, during their quarrel with the Greek empire, the Venetians, who had always partially competed with the Greeks for a share of Oriental trade, now obtained a grant of a portion of the Peloponnesus, with several of the best islands of the Archipelago. They soon secured to themselves a monopoly, or, at least, of that portion of the trade viâ the Euxine. But in 57 years, the Greeks rose in rebellion, and expelled the Latin emperor ; and having been aided by the Genoese, they bestowed on them the suburb, Pera, at Constantinople, as a reward. This transferred the overland trade to the Genoese, and forced the Venetians to revisit Alexandria, and procure Indian articles by the Red Sea.—*Gleig.*

1453.—The Turks conquered Constantinople ; and by the expulsion of the Genoese from Pera, the Venetians enjoyed the whole trade : while Constantinople was no longer a mart for Eastern produce, nor open to the countries of the West.—*Gleig.*

1497.—The Portuguese navigator, Vasco de Gama, doubled the Cape of Good Hope on the 20th November, and on the 22nd May of the following year, arrived at Calicut on the Malabar Coast, returning by the same Cape to Lisbon, in Sept. 1499.—*Gleig.*

1500.—In consequence of Vasco de Gama's success, a Portuguese expedition, under Pedro Alvarez Cabral, arrived at Calicut, on the 13th September ; formed the first European factory in India at that place, and returned to Lisbon on July 1st, 1501.—*Gleig. Picture of India. Bruce's Annals of the E. I. C.*

1501.—In the homeward voyage, discovered the Island of St. Helena.—*Bruce.*

1503.—Alphonso de Albuquerque erected the first European fortress in India, at Cochin, and re-established the Factory at Calicut ; he settled a trade at Coulan, and a factory at St. Thome.—*Bruce.*

1506.—Alphonso de Albuquerque, the founder of the Portuguese Eastern Empire, now commenced a career on a larger scale, with a squadron of 16 ships, having troops on board. He defeated the Tamorin of Calicut—formed a settlement at Goa, which he fortified, sailed to the Straits of Malacca, and took the place of that name in February, 1510, reduced the Molucca and Banda islands, at that time the gardens of the East for cloves, nutmegs, &c. and at last in 1514, finally reduced Ormus, the chief seat of Persian commerce. In 12 years, he raised the Portuguese Empire in India to the greatest height it has ever attained ; all the principal emporia from the Cape to the China frontier, an extent of 12,000 miles of coast, being in his possession.—*Gleig. Bruce.*

1517.—The Portuguese got possession of Point de Galle and Columbo.—*Bruce.*

1518.—Albuquerque recalled. The decline of the Portuguese Empire may be dated from this event.—*Bruce.*

1527.—An English merchant, Robert Thorne, long resident in Spain, asserted the practicability of a north-west passage to India. His attempt and six others, in the succeeding reigns, failed.

1530.—Sultan Baber, the eighth in descent from Tamerlane, died near Agra. He had seized the empire, and re-established the dynasty of the Moguls.—*Orme.*

.—The Portuguese driven by the natives from Ternate.—*Bruce.*

1531.—The Portuguese viceroy burned the principal towns from Diu to the Red Sea.—*Bruce.*

1536.—They built a strong citadel, at Diu, by permission of the king of Cambaya.—*Bruce.*

1538.—The Grand Seignior attacked the Portuguese at Diu from Suez, and failed ; but at this time the increased military forces sent from Portugal to India evince the decline of their real power in the East. The natives were recovering from their first panic, and found their oppressors less formidable.—*Bruce.*

1542.—The celebrated Father Francis Zavier, the Jesuit Missionary, arrived in India.—*Bruce.*

1558.—Mr. Anthony Wilkinson, agent of the Russia Company, crossed the Caspian Sea into Persia, and opened a considerable trade for Eastern produce. In India, the Portuguese viceroy, Francisco Baretto, was succeeded for 4 years by Don Constantine Braganza, one of the royal family.—*Bruce.*

1560.—Don Louis D'Ataide recovered, in great measure, the Portuguese power.—*Bruce.*

1563.—Three British agents were employed at the Persian capital, and the traffic was flourishing. Before this time the Venetians had essayed to undermine and oppose the Portuguese ascendancy, but in vain—while the humiliation, at this period,

of Venice itself, soon left Portugal without a competitor of any consequence.—*Bruce. Gleig.*

1577.—At length, an Englishman, Francis Drake, son of a poor Kentish clergyman, with five ships and 164 seamen, sailed from Plymouth on the 13th December, commissioned by queen Elizabeth. He passed the Straits of Magellan, ravaged the west coast of America, crossed the Pacific, touched at the Moluccas, and stopped at Ternate for some time, whence, after much friendly intercourse, he steered away for the Cape of Good Hope, and arrived at Plymouth on the 26th September, 1580. Drake entertained the queen at Deptford, and was knighted.—*Gleig. Mill. Bruce.*

1579.—Again, in India, the Portuguese power was almost dissolved, and Don Louis D'Ataide was a second time sent as viceroy. His exertions were successful once more, but he soon died—in 1580.—*Bruce.*

1586.—Thomas Cavendish sailed 21st July, 1586, with three ships, viâ Straits of Magellan, and visited, after capturing a Spanish merchantman, the Ladrones, and Philippines, acquiring much knowledge of the Indian Archipelago. He returned to Plymouth 9th September, 1588. This year the Portuguese took possession of Macao, as a station for the China trade.—*Gleig. Bruce.*

1589.—Diverse English merchants petitioned the queen for permission to make a voyage with three ships, and as many pinnaces, by the way of the Cape of Good Hope.—*Gleig.*

1591 —A squadron sailed, under Captain Haymond, and from disease and a storm, it proved an abortive enterprise—only one officer, Captain James Lancaster, and a few seamen, returned.—*Gleig. Bruce.*

1593.—An Englishman, Stevens, went to Goa with the Portuguese by the way of the Cape of Good Hope. He wrote an account of his voyage.

1595.—In the mean time, the Dutch having gone round the hitherto interdicted Cape, openly opposed the Portuguese in the Eastern seas. They supplanted the Portuguese in the Spice trade; in a very few years expelled by force their rivals from the Moluccas; formed establishments at Java and Sumatra, and swept the Chinese and Pacific oceans with an overpowering force. During the year 1595, they took possession of the Mauritius, then first occupied, but abandoned it thirteen years afterwards. Bantam allowed to be occupied that year by the Dutch, as their first factory, as a reward from the king for their aid against the Portugnese.—*Gleig. Mill. Bruce.*

1596.—Elizabeth granted strong letters of recommendation to the Emperor of China to Richard Adam and Thomas Bloomfield, merchants and citizens of London, with permission to proceed with one or more ships. The draft of the letter is dated 16th July.—*Bruce.*

1597.—The Hollanders formed a "society for trade to distant countries."—*Bruce.*

1599.—The English determining to keep pace with their rivals of Holland, an association of "Merchant Adventurers," was formed this year, a fund raised to be managed by a committee of 15 persons, and the queen again more earnestly petitioned for a charter. Her Majesty referred it to her council, and John Middenhall, a merchant, was sent, viâ Constantinople, on an embassy to the great Mogul. The first authentic deed of the Company is preserved, and is entitled "The names of such psons as have written with there owne handes, to venter in the ptended voiage to the Easte Indias, (the whiche it maie please the Lorde to prosper,) and the somes that they will adventure, the xxij September, 1599." The fund subscribed was £30,133. 6. 8. divided into 101 shares, varying from £100 to £3,000.—*Bruce. Mill.*

1600.—A corporation formed in London entitled "Governors and Company of merchants of London trading to the East Indies." Their original petition, as now extant, stated that no "*gentleman* was to be employed in any place of charge." This corporation is the origin of the present Company, and of the British empire in India. Their capital was £70,000. There were 215 sharers, and the Earl of Cumberland at their head, forming the Company. The first Court of Committees or 17 Directors was held on the 23rd September, 1600. The number was changed to 24, and then their first regular meeting was on the 31st October. Their Charter was finally dated by the queen on the 31st December of this year. At this era, and at the commencement of the English trade to India, the Portuguese possessions in the East were as follows:—Muscat, in Arabia; Ormus and Bussora, in the Gulf; Diulon on the Indus; Diu, in Guzerat; a fortified factory at Daman; the town and castle of Chaul, and a factory at Dabul; Bassein, the island of north Salsette, and Tannah; the town and fort of Goa, (their seat of power,) and factory at Onore, Barcelore, Mangalore, Cananore; the town of Calicut, a factory at Oranganore, and the port of Cochin; and factories at Coulan, Quelon, and Taccatra. They had established themselves at Ceylon, and fortified Jaffanapatam. On the Corromandel coast they had stations at Negapatam and St. Thome. In Bengal they had no factories but

commercial stations, or houses of trade. They had factories at Pegu, traded up the Martaban river; had a station at Junkceylon, and possessed the valuable town and fort of Malacca. They had establishments in the Moluccas, at Amboyna, Manilla, and Macao, in China. Notwithstanding these valuable possessions, the Portuguese power in the East had visibly decreased, and was prepared to give way to the Dutch and English, now entering the field.—*Bruce.*

1601.—The earliest ship purchased was the Susan of 240 tons, for £1,600, thus the first Indiaman in the service. The Company fitted her out with three others, the Malice-scourge of 600 tons, the Hector of 300, the Ascension of 260, and a pinnace of 100 tons, freighted with cloth, tin, lead, cutlery, glass, amounting to £6,860, and with £28,742 in bullion. The fleet was commanded by Captain James Lancaster as "General or Admiral," and Captain Davies, 2nd in command, called "Pilot Major;" the latter to have £100 wages, £200 in credit, and if the voyage gave cent. per cent. £500 at the end, if 200 per cent. £1000, if 400 per cent. £2000. The scale of remuneration to Captain Lancaster or others does not appear. They sailed on the 2nd May. The French this year endeavoured to obtain a footing in India, sending out three ships from St. Maloes, but they failed to reach their destination.—*Bruce. Gleig.*

1602.—Captain Lancaster, who had been furnished with general letters from queen Elizabeth "to the greate and mightie kinge of —— our lovinge brother greetinge," arrived at Acheen, and formed with its king the first treaty of the Company in the East; with permission to settle a factory, our first establishment.—*Bruce.*

1603.—The English fleet returned in September, having made a successful voyage. After touching at Acheen, they captured in the Straits of Malacca a Portuguese ship of 900 tons; then put into Bantam in Java, setting there a factory or "house of trade," from whence to England.—*Bruce.*

1604.—King James granted a license to Sir Edward Michelborne and others, to trade to the East; the first violation of the exclusive privileges of the Company, who designated the parties interlopers or private traders. A French East India Company chartered this year; it failed, and was afterwards dissolved.—*Bruce. Mill. E. I. Chronologist.*

1605.—Akbar died, after a reign of nearly 50 years.—*Orme.*

1606.—Cloves purchased at Amboyna for £2,948, 13; sold afterwards in England for £36,287.—*Bruce.*

1608.—Captain Hawkins visited Agra as Envoy.—*Gleig.*

1609.—A new charter granted by James to the Company, who now saw the evil of separate licenses; the privileges rendered perpetual. One of the Company's ships this year, called the Trades Increase, was eleven hundred tons.—*Bruce.*

1610.—Trade attempted with Japan, and the king's permission obtained to erect a factory at Ferando.—*Bruce.*

1611.—The court began to receive regular communications and dispatches from their factories in India.—*Bruce.*

1612.—Great efforts by the Company to extend the commerce. Attention was turned to Western India, and new factories contemplated. After repelling much opposition from the Portuguese, the English were permitted to avail themselves of a Firmaun obtained on the 11th January of the following year, to erect factories at Surat, Ahmedabad, Cambaya, and Goya.—*Bruce. Gleig. Mill.*

1613.—Up to this year, eight voyages, realising nearly 200 per cent. had been performed by various fleets, only one expedition failing; the ships of 1607, having been lost.—*Mill.*

1614.—Mr. Edwards of the Surat factory went to Ajimere as envoy to the Mogul, Jehanguire; was presented on the 7th February, by Asaph Khan, brother of the beautiful empress Noor-Mahal, and obtained an additional Firmaun. A Portuguese fleet and powerful armament defeated at Swally, with a loss of 350 men, by the English.—*Bruce.*

1615.—Sir T. Roe reached Agra, as ambassador from James I., the Company being at the expense of the embassy.—*Bruce.*

1617.—An English factory established at Macassar. At this period the Company's chief factories were at Surat and Bantam, but they had establishments at Acheen, and Tekoo in Sumatra; Jaccatra, Jambee, Potania, Siam, Japan, Succadania, Borneo, and Banda.—*Bruce.*

1618.—The Dutch obliged the English to resign all pretensions to the spice islands. They introduced themselves now as rivals also at Surat. The English Company's ship Ann, Captain Shillinge, obtained freedom of trade at Mocha.—*Bruce.*

1619.—A commission, called the Council of Defence, consisting of four members of the English, and four of the Dutch Companies, established by treaty between the nations, to prevent dispute in India. It availed nothing, as the Dutch influence preponderated. The Dutch this year attacked an English fleet of four ships at Tekoo,

sunk one, and seized the others. Firmauns were obtained from the Court of Persia, for facilities to trade in Persia.—*Bruce. Mill.*

1620.—English Agents deputed from Surat to Agra, two also sent to purchase cloths at Patna.—*Sketches of Bengal.*

1621.—James I. wrote to Shah Abbas, king of Persia, dated 19th March, thanking him for favor shown to English merchants, and requesting a continuance of such protection.—*Bruce.*

1622.—The English joining the Persians, attacked and made themselves masters of the island of Ormuz, resigning the same to their allies for part of the booty, and a grant of a moiety of the customs of the port of Gombron.—*Gleig. Bruce. Mill.*

1623.—In February, Captain Towerson, with nine Englishmen, nine Japanese, and one Portuguese, were seized by the Dutch, at Amboyna, and accused of conspiracy to attack the garrison: they were tried, put to the torture, and executed.—*Bruce.*

This cruel transaction caused much sensation, receiving the name of the Massacre of Amboyna ever after, but the particulars of the case may have been exaggerated. The king issued a commission for inquiry, yet the Dutch obstinately maintained their ground as the exclusive and rightful possessors of the Moluccas, Banda, and Amboyna; and strange though it may appear, the English government, in spite of the popular indignation, seem quietly to have acquiesced until a partial compensation, after a delay of 20 years, was enforced by Cromwell.—*Mill. Hume.*

1624.—The English factories and agencies, unable to cope with the Dutch, nearly all withdrawn from stations in the Archipelago. The Company obtained, this year, for the first time, permission to punish their servants abroad by martial as well as municipal law. The factories at Siam, Portania, and Japan withdrawn at the time.—*Bruce.*

1625.—The English, alarmed at the late massacre at Amboyna, had retired, the preceding year, from Batavia to the Island of Lagundy, in the Straits of Sunda; after much mortality, were forced to abandon it, from its unhealthiness.—*Bruce.*

1626.—In 1621, the factory at Bantam sent to the Coromandel coast, to open a trade at Pullicat; but the Dutch effectually opposed the attempt. In the following year, they seem to have succeeded in establishing a trade house at Masulipatam, and secured a considerable quantity of coast goods. In February, 1826, the English erected a small factory at Armagon, under Mr. Johnston, a Factor, which they slightly fortified, as a subordinate station to Masulipatam, and as a retreat, in case of need. Thus originated our transactions on the coast of Coromandel. The English wished to seize the Island of Bombay, and fortify it as a retreat from the native powers; the plan was not carried into effect, but now also was attention first directed to Bombay.—*Bruce.*

1627.—Jehanguire died.—*Orme.*

1628.—In consequence of the oppression of the native Governor of Masulipatam, it was abandoned for a time by the factory for Armagon, which now mounted 12 pieces of cannon, and had 23 factors and soldiers.—*Bruce.*

1629.—Bantam reduced to an agency, dependant on Surat; this proving inconvenient in its relations to the Dutch, it was again, in five years, restored to a presidency. —*Bruce. Hamilton.*

1630.—Armagon reinforced by 20 soldiers, and placed under the controul of Surat. Off Surat, the Portuguese, with a large fleet, and 200 soldiers, made several fruitless attempts against the English shipping. They also made violent efforts without success, to regain their power in the Gulf.—*Bruce.*

1631.—A proclamation* by Charles I. enumerates, this year, the exports and imports of the Company, viz. exports, "perpetuanoes and drapery, (broad cloths, &c.) pewter, saffron, woollen stockings, silk stockings and gaiters, ribbands, roses edged with gold lace, beaver hats with gold and silver bands, felt hats, strong waters, knives, Spanish leather shoes, iron and looking glass;" the imports were "long pepper, white pepper, white powdered sugar, preserved nutmegs and ginger preserved, myrabolums, bezoar stones, drugs of all sorts, agate beads, blood stones, musk, aloes Socatrina, ambergris, rich carpets of Persia and of Cambaya, quilts of sattin, taffety, printed calicoes, benjamin, damasks, sattins and taffaties of China, quilts of China embroidered with gold, quilts of Potania embroidered with silk, galls, worm seeds, sugar-candy, China dishes, and porcelain of all sorts."—*Bruce.*

1632.—A Firmaun obtained from the king of Golconda, for the re-establishment of the factory at Masulipatam.—*Bruce.*

1633.—The Emperor of Delhi ordered the Soubadar of Bengal, Kassim Khan, to "expel the (Portuguese) idolators from his dominions." In consequence, the fort at Hooghly, under Michael Rodrigues, was seized after a brave defence. The Por-

* The proclamation does not mention Indigo; but about this period there was a large contract for its supply to the English, at Agra, and much loss was sustained, as it found, at that juncture, no ready sale either in Persia or England.

tuguese were spared, but their idols were destroyed. This is the first act of hostility against Europeans recorded by the native historians.—*Dow.*

A French Company again attempted, with a fruitless effort, to colonise Madagascar.—*Gleig.*

1634.—On the 2nd February a Firmaun was obtained from the Mogul, for liberty to trade in BENGAL, without any other restriction, than that the English ships were to resort only to the port of Pipley. *This fixes the precise period in which the English were first permitted to enter the Ganges.* The President and Council at Surat, in great disgrace with the Court, having been discovered, from quarrels among themselves, to have been largely carrying on a private trade; they threw themselves on the mercy of the Court.—*Bruce.*

Mr. Morris, a factor from Masulipatam, sent to Bengal to avail himself of the Emperor Shaw Jehan's Firmaun: he reported from Pipley, that provisions for the Company's factories on the coast, and abundance of fine white cloths, were procurable on reasonable terms.—*Bruce.*

1635.—A new English Company, or association, under Sir W. Courten*, chartered by Charles, upon the unjust grounds that the London Company had "neglected to establish fortified factories, or seats of trade, &c." The latter petition against the infringement, and send orders to their servants in India not to assist or encourage the interlopers.—*Bruce. Anderson.*

1636.—Courten's vessels seized and plundered two junks of Surat and Diu. The Mogul authorities would not comprehend the distinction of Companies, and imprisoned the president and council of Surat for this aggression of their countrymen. Pirates also seized the opportunity of infesting the Indian seas. The President released only on paying 1,70,000 rupees to the Mogul. English Trade depressed at Surat, while the Dutch brought 22 large ships, with proportionate stock, to Bantam.—*Bruce. Mill.*

1637.—Captain Weddel, formerly a Company's servant, but now a leading instrument of Courten, fixed an Agency at Goa, and at Batticolo; he obtained a grant for a factory at Acheen, and attacked and carried a fort at Canton, collecting many bales of China goods, but being obliged to quit those seas, he fixed a factory at Rajahpore, in the king of Vijiapore's dominions.—*Bruce.*

1638.—Armagon found unsuited to commerce.—*Bruce. Hamilton.*

1639.—Mr. Day, one of the council, sent, in consequence, to the vicinity of St. Thome, who reported Madraspatam as favorable, and that the Naig of the district offered land and every aid for building a fort. So important did the situation appear, that, on their own responsibility, the council at once commenced the fortification, and it soon became surrounded with the town. They named it *Fort St. George.*—*Bruce. Hamilton.*

1640.—The distress of Charles I. made him oblige the Company to sell him 607,522 hogsheads of pepper, at 2*s.* 1*d.* per hogshead, for which he gave bonds and re-sold it for 1*s.* 8*d.* ready money. The Company under great difficulty in these unsettled times. Trade opened to Bussorah from Surat.—*Bruce. Mill.*

1641.—*Fort St. George* made subordinate to Bantam.—*Bruce.*

1642.—The first regular dispatch from Madras received at home is dated this year, and it is curious that Mr. Day, who founded Fort St. George, immediately went to Bengal, and that the first regular dispatch to the Court from the latter place also bears his signature, and was received the same year: it is dated 3rd November, 1642, from Balasore.—*Bruce.*

1643.—Great competition between the Dutch and English for firmauns from the Mogul, but the commerce of the Europeans must have been looked upon as inferior by the Imperial Court, for the "profusion of presents," as appears from Surat, was only 9,000 rupees altogether.—*Bruce.*

1645.—The sum of £2,294 expended hitherto on the works of Fort St. George. It required at this date £2,000 farther to complete it for a garrison of 100 men. This year is memorable for the curious and unexpected extension of our incipient power in Bengal. Mr. Gabriel Broughton, surgeon of the Hopewell, was sent for from Surat to attend the Emperor SHA'H JEHA'N. His daughter was severely burned, but Mr. Broughton cured the princess, and in reward for his services was granted, at his disinterested request, additional and new privileges for his countrymen in Bengal. In 1646 he rendered professional benefit to prince Shujao, then in the Government of Bengal, and by his subsequent intercession, factories, on advantageous grants, were established at Balasore and Hooghly.—*Bruce. Hamilton. Mill.*

1645.—The rigid and austere manners of the republican party at home, injuring the trade of the Company, the same was officially explained to the king of Persia as the reason why silks, formerly a luxury, were now less in demand. The civil wars detrimental to all sales.—*Bruce.*

* Sir W. Courten died immediately after this; but the charter was continued to his son.

This year died Noor Jehán, Empress and favorite Sultana of Jehangír.—*Dow.*

1646.—The Dutch obtained a decided superiority in the Persian Gulf, almost ruining the Bussorah and other establishments.—*Bruce.*

1647.—Courten's association having established a colony at Madagascar, got into difficulties, and resorted to the desperate measure of there coining counterfeit pagodahs and rials, to the great stain of the English character in India.—*Bruce.*

1648.—Bengal silk introduced into the investments. The communications this year, secret, and no despatches forwarded by the Company, in consequence of the danger and badness of the times.

1649.—Courten's association now assumed the name of the Assada merchants—and after much discussion an union took place between them and the London Company; but although an "United Joint Stock" was formed, only two ships and £60,000 were sent to India this season. The agents in Persia ascribe the deficiency in trade there to the rumours reaching of civil commotion in England, and the "tragicall storye of the Kinge's beheadinge, which would cause the Emperor and the Persian nobles to consider the English as a base, contemptible, unworthy nation."

1650.—Captain Jeremy Blackman appointed president at Surat, with a salary of about 400 rupees per month: private trade disallowed.

1651.—The Dutch officer Van Rubek settled a colony at the Cape of Good Hope. Outward and homeward ships had hitherto touched here, and journals were secretly deposited at Robben Island, to give information to friends arriving. The Dutch relinquished St. Helena, which the English took possession of. The residency at Surat had obtained enlarged privileges throughout the Mogul provinces, through the agency of a Mr. Davidge, sent to the Mogul's court.—*Hamilton. Bruce.*

1652.—Cromwell finding it expedient to employ the fleets and armies of his insecure government, declares war against the Dutch, and the question of the injuries to the Company made one of the grounds.—*Mill. Hume.*

The indefatigable Hollanders were now rivalling the English at Bengal in their own factories.—*Bruce.*

1653.—The English must have established a factory before this at Lucknow, as it is stated, to be withdrawn this year. Fort St. George raised to a presidency, but the garrison, on the 5th February, as per return, had only 26 soldiers. The English lost four ships to the Dutch in the Gulf.—*Bruce. Hamilton.*

1654.—Notwithstanding its new rank as a presidency, the Company had ordered the civil establishment at Fort St. George to be reduced to 2 factors, and its military force to 10 soldiers! Peace signed with the Dutch, and they agreed, as per separate article, to pay the London Company £85,000 for losses at the Eastward, and £3,615 to the heirs of Captain Towerson and others, the sufferers at Amboyna. The island of Palaroon was also restored.—*Hamilton. Bruce.*

1655.—The Persian trade suspended, and that of Fort St. George at a stand, principally from the opposition of the Dutch. There were difficulties also from fresh rivals, called "Merchant Adventurers," who, on petitioning for free trade, were at first patronized by Cromwell.—*Bruce. Mill.*

The following extracted statement of the Company's "United Joint Stock" may not be uninteresting; it was dated 1st September, 1655.—*Bruce.*

DEBIT.	£	s.	d.
Salaries of the Merchants in India for 5 years, at £2,066 2 8	9,641	19	4
Mariners' wages for like term, ...	4,000	0	0
Two years' expenses in Surat, ...	7,600	0	0
" Coast of Coromandel, ...	5,000	0	0
" Bantam, ...	2,800	0	0
Salary of Merchants on the three Brothers, ...	230	0	0
	29,271	19	4

CREDIT.			
Balance of estate in England, ...	82,053	12	2
,, remain in Surat and Subordinate Factories, ...	32,829	5	0
At Madraspatam and factories on that Coast, ...	22,671	11	3
At Bantam and Subordinates, ...	26,451	10	7
Voyage to Palaroon, ...	1,051	8	0
Fort St. George and customs, ...	6,000	0	0
Three houses in Agra, Ahmedabad, and Lucknow, with the garden at Surat, ...	1,932	0	0
Five houses at Bantam, Japara, Macassar, Jambee, and Banger Masseen, ...	3,600	0	0
Two ships, a sloop, and pinnace, ...	1,000	0	0
	1,85,589	7	0

1656.—Reductions in all the establishments abroad; supernumeraries sent to England. Columbo taken from the Portuguese by the Dutch, who also, this year, established Chinsurah as a factory.—*Bruce. E. I. Chron. Hamilton.*

1657.—The London Company suffered much from the intrigues of rivals. At last Cromwell failing to open a free trade with advantage to the country, on the opinion and advice of his council of state "that the trade of East India be managed by a United Joint Stock, exclusive of all others," consented to grant a new Charter, on the 10th February, and took the Company under his especial protection. From this year the Company attempted to settle permanently at St. Helena.—*Bruce. Mill.*

1658.—The Bengal establishments ordered from home to be continued under the presidency of Fort St. George, the agencies at Cossim Bazar, Ballasore, and Patna to be subordinate to the factory at Hoogly. Surat the chief presidency; new regulations made for the servants in India. The emperor, Shah Jehan, being afflicted with mortal illness, his four sons contended for the succession. Aurangzebe's superior abilities and cunning prevailed. The Dutch completely expelled the Portuguese from Ceylon.—*Bruce. Dow.*

1659.—In consequence of the new charter, the English trade revived in India. Aurangzebe became emperor, Shah Jehan lived some years afterwards, confined at Agra.—*Bruce. Dow.*

1660.—The uncertainty of public affairs in England, after Cromwell's death, prevented the Company from making this year any exertions at home. A China Company attempted in France.—*Bruce. E. I. Chron.*

1661.—The embarrassments of the Company's funds at the commencement of this year again so great, it was resolved to relinquish many out stations in India, and instructions were issued to this effect, but on the 3rd April, Charles II. granted a new charter "for ever," with considerable privileges. The Company were authorized to make peace and war with any prince or people not Christians, erect fortifications, maintain armies, send home unlicensed Englishmen, and administer justice as a sovereign state. The Portuguese power in the East now reduced to the possession of Goa and Diu, the Dutch having expelled them from their ports on the coast of Malabar. The Island of Bombay ceded to the English by Portugal, as a marriage portion to Charles II. but its final possession withheld for four years, on various pretences.—*Bruce. Gleig. Mill. E. I. Chron.*

1662.—The Earl of Marlborough and Sir Abraham Shipman sent by the king with troops to take possession of Bombay. The Viceroy refused to deliver up the place. On the junction of the Assada and the East India Companies, the factories in Africa had become the property of the latter. They were Fort Cormantine, Fort Wyamba, Cape Coast Castle, and Benin; but this year the king obliged the whole to be handed over to the Royal African Company. "African Labourers" had early been sent to the Indian Factories as servants and guards; their descendants were subsequently a constituent part of the military guards at the Company's principal establishments. Sir Geo. Oxinden, an able man, sent out as "President and chief director of Surat and all other factories," in the north parts of India. He received however a salary only of 250 rupees per mensem, and a yearly gratuity of 2,000 rupees as a compensation for private trade.—*Bruce.*

1663.—Factories which had been attempted at Patna, Cossim Bazar, and Ballasore ordered to be discontinued, and purchases and sales made only at Hooghly. Major F. Willoughby appointed from home, Governor of the Island of Palaroon, at a salary of £50 per annum, for five years.—*Bruce.*

1664.—A French East India Company formed under the minister Colbert.—*E. I. Chron.*

In January, the town of Surat pillaged by Sevajee, the founder of the Mahrattas. Sir George Oxinden bravely defended the English factory, and the Mogul granted an exemption from customs for one year, in token of his admiration.—*Bruce.*

Sir A. Shipman, the deputed Governor of Bombay, perished by disease at Angedevah, with 300 soldiers, the Portuguese refusing to comply with the treaty, and the English factory of Surat afraid to admit armed men, from apprehension of the Mogul's displeasure. About 100 men only survived of four companies, when the Portuguese finally gave up Bombay, but without any of its dependencies.—*Bruce.*

1665.—The Mogul, jealous of the possession of Bombay by the king, but unable to comprehend the distinct characters of the King's and Company's establishment.

Mr. Foxcroft sent out as president at Fort St. George, when the incumbent, Sir Edward Winter, seized his intended successor on some pretence of treasonable speeches, and contumaciously held the fort for nearly two years.—*Bruce.*

The deposed emperor Shah Jehan died in confinement at Agra.—*Fraser.*

1666.—By the fire in London the Company's saltpetre and pepper ware-houses, then under the exchange, destroyed. Tea imported in England from Holland by the Lords Arlington and Ossery; it sold for 60s. per lb.; but two years previous, small quantities had reached, as presents to the king.—*Bruce. E. I. Chron.*

Sir Gervase Lucas sent out to Bombay as Governor, by the King; he imprisoned the acting Governor, Mr. Cooke, Secretary to the late Sir A. Shipman, for extortion and peculation.—*Bruce.*

1667.—Palaroon ceded to the Dutch by the treaty of Breda.—*Anderson.*

Aurangzebe, in his wars with Persia and Sevajee, began to value European military talent, and demanded from Surat some artillery men and engineers for his armies. The request was evaded.—*Bruce.*

1668.—Bombay ceded by the king (23rd September) to the Company. Its revenues, as per return on cession, were £2,833 per annum. The two companies then stationed there, of H. M. soldiers, volunteered into the Company's service, and thus formed its first military establishment at Bombay*.

This year Tea is first mentioned in the Company's dispatches. A letter to Bantam from the Court, thus orders the agent, "*send home by these ships 100lb. weight of the best tey, that you can gett.*"

Mr. Cooke, ex-Governor of Bombay, who had escaped to Goa, associated himself with Jesuits, and endeavoured to assemble a force to repossess himself of Bombay: proclaimed a traitor. The revenue of Bombay more than doubled itself, under the Company the first year.—*Bruce. Hamilton.*

1669.—Sir G. Oxinden appointed from home "Governor and Commander-in-Chief" at Bombay, but he died on 14th July of the preceding year.

This year also were received orders from home, to institute a pilot establishment at Hoogly, to build a pinnace to be manned with intelligent seamen from the Indiamen, to take charge of the shipping up and down. Thus originated the Bengal Pilot Service.

St. Helena now regularly colonised under Captain Stringer, appointed Governor; the Captains of Indiamen touching there to act as members of his council. There were 22 regular Indiamen then in the service, as appears by a list of those entitled to act as members of the St. Helena council.

The military regulations in use, to controul the small force at Bombay, founded on authority vested in the Company, by charter, to levy, embody, and entertain forces, &c. Their military establishments were thus upheld for years, until king's troops, serving in India, questioned their competency to hold courts martial.—*Bruce.*

1670.—The English trade considerably increased, as apparent from the fact of the outward investment of bullion and goods being £305,500. But the Dutch influence predominated; their ships from Europe this season were 52 in number.—*Mill.*

1671.—Bombay rising; in consequence, a mint ordered, and the building of two ships and two brigantines commenced upon. Captain Herman Blake, who came round viâ Persia, appointed engineer and surveyor general; the first of that rank.

Surat again attacked, but well defended: its situation now deemed precarious for a presidency.—*Bruce.*

1672.—The presidency at Surat, in a letter on military subjects, recommended that the "principle of seniority must be observed in adjusting the rank of the officers at Bombay."—*Bruce.*

The French capture St. Thome, it was retaken two years subsequently by the Dutch and king of Golconda, when the French purchased the village and district of Pondicherry, which they fortified.—*E. I. Chron.*

The oldest record of the Company extant in 1792, at the presidency of Fort St. George, bears the date of this year. It is a letter from Bantam, dated 1st June. Its recorded "abstract" was as follows:

"Mentions that the Company had ordered Factories to be established at

"Tonkeen, whither was sent	Mr. W. Gifford in the Zant.	
"Tywan	do.	David Stephens, Experiment,
"Japan,	do.	Symon Delboe†, Return."—*Dalrymple's Orient. Rep.*

The Court recommended the Council, for the first time, at Bantam, to open a direct trade to China, and, at the same time, with reference to the attempt above alluded to, settle at Tonkeen, Tywan, and Japan; ordered their agents "to wear dresses of English cloth, with gold and silver lace, that their appearance might convey to the emperor and his officers impressions of their rank."—*Bruce.*

1673.—St. Helena having been several times taken and retaken, recaptured this year by a naval force from the Dutch, and regranted by charter to the English Company.—*E. I. Chron.*

* Derivation of Bombay doubtful, said to be from Buon Bahia, Portuguese; also from Bomba Devi, a Hindoo goddess.

† Mr. Delboe failed, it seems, at Japan, and was ordered away. The English flag had the St. George's cross, and thus somewhat resembled the Portuguese flag, which nation was hateful to the Japanese. The alliance by marriage with the princess of Portugal was also given as another cause, but Mr. Delboe returning by way of Macao, negotiated for permission to establish a factory there, and probably to this incident may be traced the origin of the present China Trade.—*Bruce.*

The outward India fleet divided into three squadrons, under an "Admiral, Vice Admiral, and Rear Admiral."

Englishmen sent to Bengal to improve the silks, and dye the green and black colours, "but under an obligation to keep their art secret from the natives."

The Dutch fleet so powerful off Bombay and Surat, that 500 Rajpoots were sent for to defend these places. The French had taken Trincomalee from the Dutch, who now recovered it by a force from Batavia.—*Bruce.*

1674.—Bombay mounted 100 pieces of cannon.—*Bruce.*

1675.—The Court write out that Lahore indigo was undersold by West-India indigo, and that less lac would be required from "the new practice of using wafers instead of wax."—*Bruce.*

Mr. Delboe formed a factory at Siam.—*Dalrymple.*

The Court, 12th July, framed the following regulations for their civil service. "In the advancement of our apprentices, we direct that after they have served the first five yeares, they shall have £10 per annum for the two last yeares, and having served those two yeares, to be entertayned one yeare longer as Writers, and have Writer's salary; and having served that yeare, to enter into the degree of factors, which otherwise would have been ten yeares. And knowing that a distinction of titles is in many respects necessary, we do order, that when the apprentices have served their times, they be stiled *Writers*, and when the Writers have served their times, they be stiled *Factors;* and Factors having served their times, to be stiled *Merchants*, and Merchants having served their times, to be stiled *Senior Merchants.*"—*Bruce.*

Civil Servants were to apply themselves also to acquire a knowledge of military duties, so that in case of attack, or being better qualified for military than civil duties, they might receive commissions and have military pay.—*Bruce.*

1676.—The king's letters patent, dated 5th October, (28th of Charles II.,) authorised a mint at Bombay to coin "Rupees, Pice, and Budgrooks."—*Bruce.*

The Dutch had 6,720 fighting men in Batavia, exclusive of Civilians.—*E. I. Chron.*

The new charter now granted enabled the English Company to double their stock, and raise it to £739,782.—*Anderson.*

The celebrated Dr. Edmund Halley, by order of the king, sent out in a Company's ship to remain two years at St. Helena, for perfecting the knowledge of Astronomy.—*Bruce.*

The pay of an European soldier at Madras, in full for provisions and necessaries of every kind, was 21 shillings per month.—*Hamilton.*

1677.—The Company's agent at Bantam, Mr. White, and the principal servants of the agency, assassinated by the Javanese, on the 21st April, 1677, and the factory so ruined by the death of the seniors, that its transactions closed, and no accounts were conveyed to the Court.—*Bruce.*

Mr. Aungier, President at Surat, died 30th June, 1677.—*Bruce.*

1678.—A Judge appointed for the Island of Bombay.—*Bruce.*

A troop of Horse ordered to be embodied at Bombay, the pay of the Captain not to exceed £120 per annum.—*Bruce.*

Sheyntham Master, Esq. succeeded Sir W. Langhorne as Governor of Madras.—*E. I. Chron.*

1679.—The Court finding Bombay too expensive, sent out orders for retrenchments in the military charges. Surat also to be reduced to an agency, but their servants were unable to obey the Court, from the unsettled state of affairs, and the wars between Sevajee and the Mogul.—*Bruce.*

1680.—Captain Keigwin sent to command the military at Bombay with a small reinforcement; he was to have six shillings per diem and to be 3rd in council. Mr. Smith sent out as assay master on a salary of £60 per annum.

Mr. Gyfford appointed agent and governor at Fort St. George.—*Bruce.*

1681.—Surat (such the shifting state of the Company's domestic affairs at this period) again ordered by the Court to resume the rank of a presidency. The court also revoked the order for Captain Keigwin's having a seat in council. Mr. John Child, brother of Sir Josiah, the Governor (now called chairman) of the East India Company, sent out as president at Surat.—*Bruce.*

Bengal first made separate from Madras. Mr. Hedges, a member of their committees, (now called director,) sent out with special powers as "agent and governor of their affairs in the Bay of Bengal, and of the factories subordinate to it, or Cossim Bazar, Patna, Balasore, Malda, and Dacca. A corporal of approved fidelity and courage, with twenty soldiers, to be a guard to the agent's person, and the factory at Hooghly, and to act against interlopers." Such the foundation of our power in Bengal; in the sequel the centre of commerce and the seat of government in India.—*Bruce.*

The king of Bantam sent an embassy to England.—*Bruce.*

1682.—The English Levant Company, deprived of their former portion of the Indian trade, endeavoured to oppose the East India Company; but in April, the

king and privy council rejected their scheme. Persian goods at this time comprehended silks of all sorts, red and black caramania wool, rhubarb, and drugs.—*Bruce.*

The Court ordered the institution of a bank at Madras. So violent the feeling against interlopers, it was enjoined that no Company's servant should intermarry with their families.

Opium first ordered from Bengal, Bantam captured by the Dutch, and the king expelled. This gave a finishing blow to our position in that quarter.—*Bruce.*

1683.—By letters patent, dated 9th August, the king authorised the Company to exercise admiralty jurisdiction within their limits. The appointed judge, Dr. St. John, to have £200 per annum, and allowances at the Company's table.

Two companies of Rajpoots ordered to be embodied at Bombay.

Two English fleets sent out to redress the injuries to the Persian and Bantam trade.

Mr. Hedges dismissed from Bengal for misconduct, and Mr. Gyfford, who was sent to Madras, (now constituted a presidency,) directed to proceed to take charge also of Bengal with an escort of a Company, composed of seamen from Indiamen. A factory established at Tillicherry.

A serious insurrection at Bombay, on the 27th December, the fort was seized by the troops under Captain Keigwin, in consequence of retrenchments and reductions, and held in the king's name, renouncing the authority of the Company. It was forcibly retained for nearly two years, and then given up, the insurgents having stipulated for pardon *.—*Bruce.*

The Company had to put to death some rebels at St. Helena, but on the petition of the widows, to the House of Commons, the act was declared illegal and arbitrary.

India stock sold this year from 360 to 500 per cent. advance.—*Chron. Table.*

Factories established at Cuddalore and Commerce in the Gingee country.—*Bruce.*

1684.—The English formally expelled from Java, and with the Company's property, the establishments went to the Malabar coast.

Sir John Child of Surat made a baronet, and appointed the following year, Captain General and Admiral in India. Sir John Wyborne, Vice-Admiral and Deputy Governor of Bombay, with a salary of £250 per annum.—*Bruce.*

1685.—Seat of government ordered to be transferred from Surat to Bombay. The Madras government having fixed an agent and council at Priaman, on the Island of Sumatra, the Court ordered the station to be supported and fortified. Also ordered an uninhabited island in the Ganges to be obtained and fortified, while the works at Fort St. George were to be strengthened. The factory at Masulipatam to be dissolved.—*Bruce.*

1686.—Ten ships of war under Vice-Admiral Nicolson sent out to oppose the native powers. On its arrival, the agent in Bengal (Mr. Charnock) ordered to act as Admiral and Commander-in-Chief; six complete companies were on board without Captains, it being intended that the members in council in Bengal should act in that capacity. The force to disembark at Chittagong, seize and fortify it, establish a mint, and five per cent. customs to be levied on the inhabitants. It was wished to intimidate the Mogul and his officers, who had been arbitrary towards the factories. The factory at Hoogly was oppressed, and surrounded by parties of native horse and foot. Surat also had been plundered by Sevajee, and the Company's possession injured by the wars of the Mogul and Mahrattas.—*Bruce.*

Sir John Child appointed what is now called Governor General, with full authority, in India, and discretionary powers to make war or peace with the Mogul; ordered to proceed to Madras and Bengal, Mr. Zenzan to act in his absence at Surat, or rather Bombay. A company from a British regiment of the line sent out under a Captain Clifton, who as well as all Captains of Infantry was to have seat in council. —*Bruce.*

On the 28th October, a part of the fleet under Admiral Nicolson having arrived in Bengal, an affray took place at Hooghly between three English soldiers and some of the Nawab's peons; more soldiers joined, and at last the entire force came in contact, and after a severe action, the Nawab's troops were defeated with loss. Hooghly was cannonaded and 500 houses burnt. Subsequent to this useless affair, the agent and

* The officers both in rank and pay had been placed lower, and the militia so much reduced, that all authority of the officers over the men had ceased. Captain Keigwin applied for subsistence money, there being no Company's table as formerly, and after much discussion the sum of 25 Rs. per month was granted, pending a reference to the Court. The Court "unhappily ordered the half allowance for diet to Captain Keigwin to be refunded, and this parsimonious measure produced the discontents and probably the revolt of the garrison." Dr. St. John, in his report however to the King and Council, stated, that the rebellion arose from the depredations and crimes of the interlopers, with whom Captain Keigwin was intimately connected: although he used the King's name, his motives were predatory and rebellious.—*Bruce.*

council quitted their open factory at Hooghly on the 20th December 1686, and retired to Chutanuttee, (afterwards Calcutta,) waiting a negociation with the Mogul. The shipping, as the whole arrived, wanting repairs, it was deemed unadvisable to attempt the original object of the expedition, the reduction of Chittagong.—*Bruce. Stewart.*

1687.—A settlement made at Bencoolen, and a firmaun obtained for the sole government of it. A fortification called York fort built.—*Bruce.*

Bombay constituted a regency with further powers. Sir J. Wyborne and Mr. Zenzan dismissed for disputing Sir John Child's authority. To give dignity to the Governor General he was directed to be attended always with a life guard of 50 grenadiers, commanded by a Captain. Madras also constituted a regency, with a corporation, under His Majesty's Charter, consisting of a Mayor and ten Aldermen, (three to be Company's servants and seven to be natives,) to be justices of the peace, and "to wear thin scarlet gowns." One hundred and twenty burgesses to be appointed "to wear black silk gowns."—*Bruce.*

The Court disapproved of the measures of Mr. Charnock at Bengal, and recommended more active hostility. Sir John Child at Bombay however took most able measures at this difficult juncture, and determined to uphold the British name and influence in India, notwithstanding the disastrous appearances at Bengal, where our remote factories were seized, and the English troops forced to fortify themselves at Ingellee. Captain Heath had meanwhile been dispatched from home with a fresh force.—*Bruce.*

1688.—A Post Office ordered at Bombay.

Captain Heath arriving with the reinforcement in October, unwisely recommenced hostilities in Bengal; he plundered and burnt Balasore; the Mogul Governor seized the English at the factory, and sent them prisoners up the country.—*Bruce.*

1689.—Sir John Child, after capturing some native vessels at Surat, and bravely opposing the Mogul power amidst many embarrassing difficulties, died at Bombay on the 4th February, 1689. His successor, Mr. Harris, being at that time a prisoner at Surat, the Company's affairs became more alarming: submission was made to the Mogul, and a firmaun, or rather pardon, issued as to criminals. A heavy fine was exacted, on payment of which, the Siddee's fleet and army withdrew from before Bombay.

In the mean time, at Bengal, Captain Heath sailed towards Chittagong, which for some unexplained reason, he failed to attack; he then proceeded to Arracan, where he offered to assist a revolted chief against its King, but without waiting for the reply, set off for Madras, where his fleet, having on board the agent and council of Bengal, and the Company's effects, arrived on the 4th March.

The factories at Vizagapatam and Masulipatam were seized by the Mogul, and Mr. Stables, chief of the former, and four factors, put to death.

At home the Commons recommended the establishment of a new Company, the present one being little in favor with the King, parliament, or people.

It is singular that the Court, during these humiliating reverses abroad, had written out to their servants to obtain dominion; or, as the orders say, to increase revenue, "to make us a nation in India." They had found the insufficiency of firmauns, and were desirous to assume independence and power.—*Bruce. Stewart.*

1690.—The Mogul authorities invite Mr. Charnock and factory back again to Bengal. Mr. Harris proclaimed Governor of Bombay, but with no general power as his predecessor: Mr. Weldon appointed Deputy Governor. The interlopers in England associated themselves, and made every exertion to obtain a separate charter.—*Bruce.*

1691.—A new firmaun obtained by Mr. Charnock in Bengal. He had previously re-settled the establishment at Chutanuttee, protected by 100 soldiers. Ulabariah had been before tried, but found unsuited.—*Bruce.*

1692.—Mr. Charnock died 10th January, much respected by many. He was succeeded by Mr. Ellis.—*Bruce.*

Mr. Yale dismissed at Madras. Mr. Nathaniel Higgenson succeeded October 13th, to the government. The latter was superceded in December by Sir J. Goldesborough, who was appointed "Commissary General and Supervisor" of the Company's affairs in India.—*Bruce.*

An Attorney General sent to Madras for the better regulation of the Company's interests.—*Bruce.*

At Bombay European pirates had caused much inconvenience to the trade, and irritation on the part of the Mogul.—*Bruce.*

Tegnapatam had been purchased from the Ram Rajah, and fortified—was called Fort St. David.—*Bruce.*

1693.—The Company had expended at home £90,000 in influencing the Privy Council to renew the charter.—*Bruce. Mill.*

A mutiny took place at St. Helena, consequent to the temporary relaxation of martial law as directed from home. The insurgents killed the Governor, and disarmed and imprisoned the soldiers of the garrison. Captain Keeling sent out with a force to reduce the island to obedience.—*Bruce.*

A new charter granted on the 7th October (5th William and Mary) renewing that of Elizabeth, with some modified and some extended privileges.—*Bruce.*

1694.—Bengal, after Mr. Charnock's death, again made subordinate to Madras. Sir J. Goldesborough, on his tour of inspection as Commissary General, dissented from the high eulogium elsewhere passed on the late Mr. Charnock. He describes him as having been irresolute and indolent. He superseded his successor Mr. Ellis, and appointed the chief at Dacca, Mr. Eyre, to be agent. He also removed Captain Hill, the military commandant, and sent him to Madras. In the midst of several spirited reforms, Sir J. Goldesborough died, and was succeeded by Sir J. Gayer, from Bombay.—*Bruce.*

During this year a Dr. Blackwall, a medical officer, for a bribe agreed to deliver up Fort St. David to the Mogul General. This treason was fortunately discovered, and Blackwall seized and punished.—*Hamsteer.*

A letter from the Court stated that "every recruit sent from England cost £30."

A fortified settlement was made from Bombay at Anjengo.—*Bruce.*

1695.—The Parliament of Scotland, on the 26th June, empowered the King (as King of Scotland) to constitute a Scottish Company. The Governor of the London Company, (Chairman) Sir T. Cook committed by the commons to the Tower, for refusing to give an account of the money distributed in bribes.—*Bruce.*

The homeward bound fleet captured by the French.—*Ditto.*

A large privateer having seized a Mogul ship, the Surat factory was seized upon, and liberated only after much difficulty on the following year.—*Ditto.*

1696.—Much distress occasioned by the interlopers: the crews of two Indiamen, stated to have been seduced by them; they rose and murdered their officers, and turned pirates—such the extent of the contagion, that the Governor at Bombay could not man a boat, for fear that the crew would desert; and so low the state of the garrison, there was not a trust-worthy soldier for promotion to the rank of sergeant or corporal.—*Bruce.*

The trade at Madras also similarly crippled, but its revenues and taxes said to have amounted to 40,000 Pagodahs.—*Bruce.*

1697.—Mr. Pitt appointed Governor at Madras; to be for 12 months independent of the Commissary General, Sir J. Gayer.—*Bruce.*

A rebellion of a Rajah Subah Sing having broken out in Bengal, it gave an opening to the French, Dutch, and English factories to erect fortifications. But for this, so jealous were the authorities, it would not have been permitted.—*Stewart.*

A new and favorable firmaun obtained from the Emperor of Persia.—*Bruce.*

1698.—An act passed 10th William, cap. 44, incorporating a new "general society trading to the East Indies." It was called the English East India Company, in contra distinction to the old or London Company.

On the passing of this act for another Company, the old corporation exerted itself, "*with a true Roman courage*," as one of their mercantile letters states, in advising their servants of an extensive equipment. They dismissed the President of Surat, Mr. Annesley, (Mr. Colt to succeed;) and permitted their establishments, as an encouragement, to trade in jewels. At Madras all former factories or stations were to be resumed, so as to exclude the new Company. Bengal was again made independent of Fort St. George.

Captain Kyd, the notorious pirate, formed his ships into squadrons, and fairly blockaded the coasts: in consequence, the Mogul, who would not understand the distinction between this outlaw and the other English, put the whole trade under an embargo.

The new English Company sent Agents to India, chiefly men who had been dismissed with disgrace, from the London Company. Sir William Norris was appointed by the King's Commission, an Ambassador to the Mogul, to solicit privileges for the new association.—*Bruce.*

1699.—Sir Edward Littleton was appointed President and Consul, in Bengal, of the new Company; he was also empowered to act as King's Consul. He was ordered to report on all the plans and trade of the London Company, to obtain from the dismissed servants all possible information, copies of firmauns, &c. Sir Nicholas Waite was appointed their President, at Surat. The new Company, however, at this early stage, made approaches for an union between the rivals.—*Bruce.*

The Mogul Prince Azeem Ooshan granted in 1698-99, the adjacent small villages of Chutanuttee, Govindpore, and Calicotta, (dedicated to the goddess Calee,) the whole soon taking the name of the last, or CALCUTTA. Sir Charles Eyre, recently knighted, an old servant, was again sent to India, to be principal servant in Bengal, which they now constituted a presidency. The instructions to Sir C. Eyre, dated

December, 1699, directed him to increase the fortifications, to build a strong fort of pentagonal form, to be called *Fort William.—Stewart. Bruce.*

1700.—The London Company obtained an act, on the 11th April, for continuance of their corporation, and the King recommended an union of the two interests.

In India, the new Company's servants insulted and committed violence on the flag and factory of the London Company, at Surat, which was resented by the Mogul Governor, as an affront to himself. The trade was much injured every where.

At Madras, disputes took place between *Consul* Pitt, and *Governor* Pitt, the rival Governors of the two companies; in fact, throughout India, as might be expected, the hostile rivalry of both companies ruined the trade for all concerned. The new Company made some progress, in opening a trade with China, though it failed eventually.—*Bruce.*

1701.—The disputes of the old and new Company most perplexing and ruinous. The native rulers took bribes from both parties. The Ambassador, Sir W. Norris, seized two of the Council of the London Company, at Surat, and sent them to the Mogul Governor, "with their hands tied." Sir John Gayer, the President, subsequently was seized by the Emperor's order, obtained through misrepresentation, and with the other members of Council, "barbarously used."

A Committee appointed at home, to endeavour to effect an union between the Companies.

Sir W. Norris had an audience of the Mogul, on the 28th April, 1701. He was attended by a splendid European cavalcade, with ordnance, and many followers.

Kyd, the pirate, taken, and hanged at home. He had been supported by some noblemen, Lord Somers and Orford, who were impeached.—*Bruce. E. I. Chron.*

1702.—In January of this year, the preliminaries of the union were settled.

Bengal improved, under the auspices of the Mogul Prince Azeem Ooshan. The instructions from home directed the Civil Servants to proceed themselves with small stocks, in the Aurungs, and bargain themselves "without the affectation of pomp and grandeur, *and as merchants ought to do.*"

The ambassador abruptly broke off the negotiation at the Mogul's Court, and departed for Surat, which circumstance, with the depredations of the pirates, so incensed the Emperor, that he ordered all the English in his dominions to be seized, imprisoned, and their effects confiscated. All the subordinate agencies suffered in consequence, but Calcutta by this time was too strong to be thus dealt with.

In the deed of union by which the two Companies were hereafter to take the name of "the united Company of merchants trading to the East Indies," the factories of the old Company are thus detailed.

Bombay: Surat, Swally, Broach, Ahmedabad, Agra, and Lucknow.

On the Malabar Coast: the forts and factories of Carwar, Tillichery, Anjengo, and Calicut.

Persia: the factories of Gombroon, Shiraz, and Ispahan.

Fort St. George, Madras, Fort St. David, Cuddalore, Porto Novo, Pettipolee, Masulipatam, Madapollam, and Vizagapatam. The settlements on the Island of Sumatra, or York Fort, Bencoolen, Indrapore, Tyamong, Sellebar; also the factory of Tonquin in Cochin China.

Fort William: Chuttanuttee, (*Calcutta* not yet specified it seems,) Balasore, Cossim Bazar, Dacca, Hoogly, Malda, Rajhmahl, and Patna; also the Island of St. Helena.

The new Company specify in the deed only the following settlements. A factory at Surat, at Masulipatam, at Madapollam, and on the Islands of Borneo and Pulo Condore.

The Indenture farther sets forth as stock:

Old Company,.....	£315,000	0	0
New Company, ...	1,662,000	0	0
Separate Trades,.....	23,000	0	0
Total ..	£2,000,000	0	0.—*Bruce.*

1703.—On the union above referred to, Sir John Gayer was appointed by the General Court, "General and Governor" of Bombay, and Sir Nicholas Waite's commission, under the English Company, of Consul, revoked. President Pitt was confirmed at Madras, and consul Pitt made chief authority at Fort St. David, his commission of consul being cancelled. President Beard confirmed at Bengal, though a commission of eight were appointed to investigate and control all proceedings at Fort William. There was still much dissension between the late rival authorities throughout India, and much difficulty in the attempts at adjustment.—*Bruce.*

1704.—Sir John Gayer having been imprisoned by the Mogul authorities, Sir Nicholas Waite, who was appointed to succeed in case of vacancy, basely contrived

to prolong his detention, by bribes and iniquitous misrepresentations to the natives. The disputes between the rival servants still kept up in adjusting accounts and outstanding commercial transactions.—*Bruce.*

1705.—The treachery of Sir Nicholas Waite fully discovered by the disclosure of his instrument, Rustum, a native broker ; but in defiance of orders from the General Court, he retained authority, and Sir J. Gayer was still in confinement at Surat. —*Bruce.*

1706.—At Bengal the affairs were becoming settled ; Sir Edward Littleton, the late president of the new Company, having been recalled, and Mr. President Beard having died. Messrs. Hedges and Sheldon were appointed jointly to succeed and bring up the accounts of the two Companies.—*Bruce.*

1707.—Aurungzebe died on the 20th February. His revenues were equal to 38 millions sterling. To shew the general fear entertained of the imperial power by foreigners then in India, it was thought necessary to announce it to the Court in an allegory. Thus in a letter dated 1st March, 1707, Sir J. Gayer (previously released) represented, "that the sun of this hemisphere had set, and that the star of the *second* magnitude being under his meridian had taken his place, but it was feared the star of the *first* magnitude, though under a remoter meridian, would struggle to exalt itself," thus conveying the news of the Emperor's demise, and of the disputes between his sons for the succession.—*Bruce.*

The works at Fort William were by this time respectable, with a number of guns, and 125 soldiers, of whom half were Europeans : many natives began to settle in its vicinity.—*Bruce.*

Madras at this period had only 300 European settlers, of whom 200 were military.—*Hamilton.*

1708.—The time drawing on far to final incorporation of the accounts and affairs of the two Companies, which was ordered for this year, their feelings and interests became identified by a sudden demand from H. M.'s government for £2,200,000, without interest. All their closing dissentions gave way to avert the common danger, and on the 29th September, 1708, a final award and charter was adopted. By this act, 6 Anne, cap. 17, the privileges were to be extended to March, 1726. At this juncture, the number of directors, their duties, committees, mode of sales, warehousing, and home establishments were adjusted, and have remained with little alteration on the same footing to the present day.

Thus were closed the transactions of the English in establishing a trade with India, until the act of legislature confirming the corporate capacity of THE UNITED COMPANY OF MERCHANTS TRADING TO THE EAST INDIES.—*Bruce.*

1709.—It may be gathered from the following circumstance, how deeply the contentions of the two rival Companies before their union had injured the entire trade, and the prosperity of the English in India.—The King of Persia just before this period wished to send an embassy to Bombay, but ashamed to betray the weakness of its defences and garrison, and the general poverty of the place, the English authorities refused to admit it.—*Hamilton.*

Thomas Pitt, Esq. Governor of Madras, was succeeded (30th of September) by Gulston Addison, Esq. brother of the celebrated Addison. His authority lasted but a month, as Edmund Montague, Esq. relieved him provisionally on the 28th October. While he again was superseded on the 14th November by William Fraser, Esq.—*E. I. Chronologist.*

The Company's grant of perpetuity by writ of privy seal was issued 22nd April.—*Folio state papers. Do.*

The exports of this year were £168,357, half as much again as those of the preceding season.—*Mill.*

1710.—Sadut Ally Khan commenced his government of the Carnatic.—*Orme. E. I. Chronologist.*

1711.—William Fraser, Esq. Governor of Madras, was succeeded (July 22nd) by Edward Harrison, Esq.—*E. I. Chron.*

1712.—Shah Aulum, who had succeeded Aurungzebe, died. Azeem Ooshan, the patron of the English in Bengal, lost his life in the struggle for the succession, end Feroksere, his son, afterwards gained the throne.—*Mill.*

1773.—The Bengal Presidency apply home for permission to send an Embassy to Delhi.—*Mill.*

1714.—Charles VI., Emperor of Germany, granted commissions to ships to trade to the East Indies. He afterwards founded the Ostend Company, so injurious to the interests of the English and Dutch.—*Anderson's Hist. of Com. East India Chron.*

Fort Marlborough built near Bencoolen.—*Grant.*

1715.—Messrs. Surman and Stephenson, the ablest factors of Bengal, also an Armenian, as Interpreter, and Mr. W. Hamilton, as Surgeon, were sent on an Embassy to Delhi, where they arrived on the 8th July. The Emperor Feroksere,

being sick, and prevented from marrying a Rajpoot princess, was cured by Mr. Hamilton, and the Surgeon, with the same disinterested zeal, as shown by Dr. Boughton on a former occasion, used his influence only to procure the object of the Embassy, and obtain more favorable terms for the United Company.—*Stewart's Hist. of Bengal.*

The French Company, though their affairs were desperate, obtained a renewal for ten years.—*Raynal. East India Chron.*

1716.—The marriage of the Mogul Emperor intervening, the Embassy could not deliver their petition until January of this year.—*Mill.*

The Governor of the French settlement of Pondicherry announced to the British, at Fort St. David, that there were off the Malabar Coast, two 40-gun vessels, under imperial colours, from Ostend. The Ostend Company were not regularly chartered till some years afterwards.—*Grant.*

1717.—The objects of the Embassy of 1715 attained in July. Thirty-four favorable grants or patents were issued by the Mogul, and the English allowed to purchase 37 towns contiguous to Calcutta. The privileges now granted were long considered as constituting the great charter of the English in India.—*Rennell's Memoirs. Grant.*

1718.—The Ex-Sultan Guelemot, of Anaksoongay, in Sumatra, raising a force, destroyed the town of Ippoe, with the British Resident and all his people.—*Grant.*

1719.—A native force obliged the English to evacuate Fort Marlborough, and take refuge on their ships.—*Grant.*

Feroksere deposed and murdered : four successors appeared and passed away in as many months.—*Orme.*

1720.—The French took possession of the island, called by the Dutch, Mauritius, who possessed it for a short time ; but abandoned it for the Cape of Good Hope. The French peopled it from the Isle of Bourbon, and named it the Isle of France.—*Raynal. East India Chron.*

Jos. Collet, Esq., Governor of Madras, succeeded by Francis Hastings, Esq.—*East India Chron.*

1721.—The natives of the Island of Sumatra, fearing the Dutch more than the English, whom they had expelled, allowed the latter, in the hope of their counteracting the intriguing activity of the Dutch, to resume their Sumatran establishments. The English now remained at peace for many years, increasing in prosperity and in influence over the natives.—*Grant.*

Francis Hastings, Esq., Governor at Madras, succeeded by Nat. Elwick, Esq.—*East India Chron.*

1722.—The Emperor granted this year a regular Charter to the "Ostend East India Company," to the great discontent of all the European maritime powers, except Spain*.—*Salmon and others. East India Chron.*

1723.—The Ostend Company had fully established themselves, under the Nawaub's patronage, at Bhany Bazar, 15 miles above Calcutta, at the eastern side of the river.—*Stewart. East India Chronologist.*

1724.—Shuja Addeen Khan, afterwards Nawaub of Bengal, though of liberal disposition, about this period, was incensed against the English, in consequence of their public servants taking advantage of the late grants of the Emperor, and insisting upon passing their own private trade free of duty. The Foujdar of Hooghly, stopped a boat laden with silks, upon which a party of soldiers was dispatched from Calcutta, and forcibly released the boat. The English were finally obliged to pay a heavy fine, and apologise for this act.—*Mill. Sketches of Bengal.*

1725.—Nathaniel Elwick, Esq., Governor of Madras, is succeeded by James Macrae, Esq.—*East India Chron.*

During the quinquennial period, from the year 1720 to 1725, the English had exported to India, £578,155 of goods, and 2,770,238 of bullion.—*Grant.*

1726.—By letters patent, dated August, George I., complied with the petition of the United East India Company, and established, at the three Presidencies of Madras, Bombay, and Calcutta, regular Courts of Record, for the discharge of both Civil and Criminal Justice. The Courts to consist of a Mayor and nine Aldermen, of whom seven were to be natural born subjects. The Mayor to be elected by the Aldermen, and to continue in power for one year. Appeals allowed to the Governor in Council. The Governors and Senior Members created justices of the Peace, and empowered to hold quarter sessions.—*Grant.*

So flourishing were the affairs of the Ostend Company, in spite of the opposition and edicts of the rival nations, that this year, one-third of the original subscription of the proprietors, which remained due, was paid up from the gains alone of the trade.—*Mill.*

The East India House erected in Leadenhall-street, London.—*E. I. Chron.*

* Mill states, that the Charter was granted in August, 1723.

1727.—So much had the country trade increased, in ten years, after the patents or grants obtained by the Embassy to the Emperor, in 1717, that the private tonnage employed in Bengal, by this time amounted to 10,000 tons. Many of the Company's Servants were concerned in this trade.—*Grant. Mill.*

The Court at Vienna, after much hesitation, at length yielded to the combination of the European powers, against the Ostend Company. The Emperor suspended its charter for seven years, thus virtually abolishing the Company*.—*Grant.*

1728.—The Danish East India Company, residing at Copenhagen, published proposals for a new subscription, and the following year, they obtained extraordinary privileges, from the king of Denmark, who declared his intention of making it the most flourishing Company in Europe.—*Anderson. E. I. Chron.*

1729.—The Dutch Company had their Charter extended for 23 years, for which they paid the Republic a large consideration; at this time, their wealth and power in India, particularly at Java, equalled those of several monarchs.—*Anderson. E. I. Chron.*

1730.—The Charter, after much discussion, renewed to the English United East India Company, for 33 years. The Charter to expire on Lady Day, 1769, including the three years' grace.—*Mill.*

Four English China ships arrived this year, with 1,707,000 lbs. of tea, and three other Indiamen, with 371,000 pieces of calicoes, besides other valuable merchandise. —*Anderson. E. I. Chron.*

From 1725 to 1730, the English Company exported goods, £551,234, and bullion, £2,551,872.—*Grant.*

1731.—The king of Sweden set on foot an East India Company, for trading from Gottenburg. A Charter granted for 15 years.

The king of Portugal formed a temporary East India Company, with *one* ship, to trade to Surat. Their former Empire in the East thus reduced!—*Anderson. East India Chronology.*

1732.—The English Company first began to make up annual accounts. This year their sales amounted to £1,940,996. But their competitors, the Dutch, were far exceeding them in return and profits; thus in 1732, the English reduced their dividends, from 8 to 7 per cent. per annum, which thus continued till 1744. The Dutch during a main portion of that time, realised 25 and 20 per cent. upon the capital stock, and never less than 12½.—*Mill.*

1733.—Mr. Freke's government of Fort William commenced.—*E. I. Chron.*

1734.—Under the able rule of Shuja Addeen Khan, the provinces of Bengal, Behar, and Orissa greatly improved. His power was respected by the Europeans.—*Stewart.*

M. Mahe de la Bourdonnais, afterwards famous in India, was commissioned to improve the Isle of France, by the French Company. To this officer the island is indebted for its forts, aqueducts, bridges, hospitals, and granaries. The French influence and trade fast improving in the East.—*Mill. E. I. Chron.*

1735.—The Mahrattahs had made such progress, that they burned the suburbs of Delhi, under the Emperor Mahomed Shah, who, (after the demise, in 1819-20, of the two infants, Ruffeh ad Durjaut and Ruffeh ad Doulah,) had succeeded Feroksere on the Musnud. The Mahrattahs acquired the greater portion of Malwa, and a grant of the fourth part of the net revenues of the other royal provinces; thus originating the *Chout.—Hamilton. Rennell.*

From 1730 to 1735 the English Company had exported £717,854 of goods, and £2,406,078 of bullion.—*Grant.*

Richard Benyon, Esq. succeeded George Morton Pitt, Esq. as Governor of Madras. His government lasted nine years.—*Dalrymple.*

1736.—A proclamation was issued in January, prohibiting British subjects from trading to the East Indies, contrary to the liberties and privileges granted to the Company; or from serving in, or being on board any ships unlawfully trading. This was probably to prevent connexion with foreign Companies.—*E. I. Chron.*

1737.—Calcutta nearly destroyed by a hurricane and earthquake†.—*E. I. Chron.*

* It was afterwards altogether dissolved by the treaty of Seville; but the Germans were not finally expelled from Bengal, until 1733. In 1730, their factory, at Banhy Bazar, was in existence, and an English naval force seized one of their ships, and drove another under the factory guns. The Dutch and English shortly after, by intrigues and misrepresentation, induced the Foujdar at Hooghly to invest the factory, which made a long and gallant defence, with a garrison reduced to only 14 men. At length, the agent, or chief, being severely wounded, the factory was evacuated, the little garrison reaching the ships in safety, and the Mogul troops, taking possession of the empty fort, levelled the works to the ground.—(*Stewart.* Gladwin's Nar. of Govt. Bengal.)

† The following extract is from the *Gentl man's Magazine,* printed in 1738-39. "In the night between the 11th and 12th October, (1737,) there happened a furious hurricane, at the mouth of the Ganges, which reached 60 leagues up the river. There was, at the same time, a violent earthquake, which threw down a great many houses along the river side: in Galgotta, (i. e. Calcutta,) alone, a port belonging to the English, two hundred houses were thrown down, and the high and

1738.—Mr. Freke, Governor of Fort William, was succeeded by Mr. Cruttenden, who was succeeded in the following year, by Mr. Braddyth.—*E. I. Chron.*

1739.—Nadir Shah entered and plundered Delhi. 120,000 persons were massacred. —*Stewart, Hamilton, and others.*

Shuja Addeen Khan, Nawaub of Bengal, died, and was succeeded by his son, Serferaz Khan.—*Stewart.*

1740.—Nadir Shah, after dreadful exactions and tyranny, departed from Delhi.—*Stewart.*

Serferaz Khan attacked by Ally Verdy Khan, and slain in battle : succeeded by the latter.—*Stewart.*

Thirty thousand insurgent Chinese massacred by the Dutch at Java.—*E. I. Chron.*

From 1735 to 1740, the United East India Company exported £938,970 of goods, and £2,459,470 of bullion.—*Grant.*

1741.—The Mahrattahs invaded Bengal, to demand the *Chout* of that province.—*Stewart.*

1742.—A ditch was dug round a considerable part of the boundaries of Calcutta, to prevent the incursions of the Mahrattahs.—*Hamilton.*

1743.—The Mahrattahs, with a new army, under Ragojee Bhosela, again invaded Bengal. The Nawaub Ally Verdy Khan drove them back, but his loss, in revenue, was immense, from their plunder, and the devastation they had inflicted during their incursion.—*Stewart.*

1744.—Now commences a new era in the affairs of Europeans in India, from the struggles that ensued between the rival interests of the two nations, on the proclamation of war between England and France, on the 21st May, 1744. Since the junction of the two English Companies, in 1708, the trade had been progressively improving, and the establishments in India quietly advancing ; but little had occurred politically worthy of remark, for the long period of 36 years. From this date events crowd on the notice of the chronologist.

Previous to the breaking out of the war, in February, it was agreed, at a general court of the East India Company, to lend the Government one million of money, at three per cent., as an equivalent for the prolongation of the charter, for 14 years, (from 1769 to 1783,) to commence from Michaelmas, 1744, which was confirmed by Act of Parliament of the 17th of George II.—*E. I. Chron.*

On the declaration of war, a British squadron, under Commodore Barnett, appeared in the Indian seas.—*Orme.*

Nicolas Morse, Esq., succeeded to the Government of Madras.—*Dalrymple.*

1745.—The British squadron appeared off Pondicherry ; but the Nawaub of Arcot, Anwar-ad-deen, at the instigation of Monsieur Dupliex, the French Governor, (who had succeeded to the supreme command of the French settlements, in 1742,) insisted on no hostilities being then committed.—*Orme.*

The united East India Company, from 1740 to 1745, exported £1,105,750 of goods, and £2,529,108 of bullion.—*Grant.*

1746.—Commodore Barnett died. His successor Mr. Peyton engaged, without any decisive result, a French fleet, arrived under M. De la Bourdonnais. In September, the French landed a force at Madras, which town, after a bombardment of two days, capitulated. Nothing could be lower than the English military power, spirit, and science, at this period, in India. The Madras garrison consisted only of 300 men, of whom 34 were Portuguese " vagabonds," or deserters and negroes ; 60 were sick and ineffective, and only 200 soldiers fit for duty. The officers were three lieutenants, of whom two were foreigners ; and seven ensigns, who rose from the ranks. Only one lieutenant and one ensign were deemed efficient officers.—*Mill. Orme. E. I. Chron.*

Mr. Braddyll, Governor of Fort William, succeeded by Mr. Forster, who was succeeded by Mr. Dawson the following year. Fort St. David became the presidency, by the surrender of Madras.—*Dalrymple.*

1747.—Fort St. David invested by the French, who retired on the return to the coast of the British squadron, under Capt. Peyton.—*Orme. Mill.*

1748.—Major Lawrence, subsequently celebrated in the coast army, arrived in January, from England, with a commission, to command the Company's forces. Also Admiral Boscawen, with 13 men of war, and 17 other ships, with a considerable

magnificent steeple of the English church, sunk into the ground without breaking. It is computed, that 20,000 ships, barks, sloops, boats, canoes, &c. have been cast away. Of nine English ships, then in the Ganges, eight were lost, and most of the crews drowned. Barks of 60 tons were blown two leagues up into land, over the tops of high trees : of four Dutch ships in the river, three were lost with their men and cargoes. 300,000 souls are said to have perished. The water rose forty feet higher than usual, in the Ganges." N. B. The steeple of the church was described to have been lofty and magnificent, and as constituting, before this period, the chief ornament of the settlement.—*Sketches of Bengal.*

force on board. They invested Pondicherry in their turn. Ensign Clive, who came out in the civil service, but had joined the army here, distinguished himself. The seige failed, and the British retired in September. The military character of the French in India, considered at this time as greatly superior to that of the English.—*Orme.*

Mr. Dawson, Governor of Fort William, succeeded by Mr. Fetch.

Mahomed Shah, Emperor of Hindoostan, died, after a disastrous reign of thirty years. He was succeeded by his son, Prince Ahmed Mirza, who took the title of Ahmed Shah.—*East India Chronologist.*

1749.—Madras restored to the English, by the peace of Aix-la-Chapelle, signed on the 18th October, 1748. When evacuated by the French, it was found in a very improved state; the space round the works cleared and extended.—*Orme.*

The English took Devi-cottah, in supporting the claims of a fugitive Rajah of Tanjore; thus commencing to interfere, (in common with their rivals, the French,) in the quarrels of the native powers. Subsequently, in the Carnatic, the French espoused the cause of Chunda Saheb, who set up as Nawaub of the Carnatic; the English taking the side of Mahomed Ally Khan, second son of Anwar-ad-deen Khan, on the death of his father.—*Mill.*

1750.—Mr. Barwell succeeded Mr. Fetch, as Governor of Fort William.—*East India Chronologist.*

The intrigues of the French and English, with the native powers, assumed some importance; but M. Dupleix gained greater advantages than his rivals, from his greater address, deeper laid schemes, and more unprincipled conduct.—*Mill. Orme.*

Mr. Saunders took charge, as Governor, at Fort St. David.—*Dalrymple.*

1751.—On the assassination of Nazir Jung, (who had assumed the title and power of Subadar of the Dekhan, on the death of his father Nizam ul Mulk,) Mozuffer Jung was invested as Subadar. He appointed M. Dupleix Governor of the Mogul dominions, on the coast, from the Kistna to Cape Comorin, and Chunda Saheb, his deputy, at Arcot; Mahomed Ally, the protegé of the English, fled, and offered to resign his pretensions.—*Mill.*

The new Subadar was early killed, during a revolt of his troops; but M. Bussy, who now was distinguished in these transactions, procured the exaltation of Salabut Jung, who promised the same concessions to the French.—*Mill. De Bar.*

The English, under Captain Gingens, (a Swiss,) had been defeated at Volconda, but under Capt. Clive were more successful at Arcot.—*Mill.*

1752.—The seat of Government removed back to Fort St. George from Fort St. David, 17th April.—*Dalrymple.*

Mahomed Ally again resolved to oppose Chunda Saheb and the French; he was supported by the English. Clive obtained several advantages, and exhibited great military talents. He was joined by Major Lawrence, when the allied enemies were completely defeated. The French capitulated, and Chunda Saheb delivered himself up. This prince was immediately assassinated by the native allies. It is said, that Major Lawrence might have prevented this lamentable fate, but it would seem he was wrongfully accused by M. Dupleix of being accessary to it.—*Mill.*

The new style took place in England, on September 3rd, which day became the 14th.—*E. I. Chron.*

1753.—Dupleix, not disheartened, again made efforts against his rivals; but the few English troops under Lawrence and Clive, were fast surpassing the French in India, in all the qualities of soldiers; the officers were better—the men more orderly. The English had 700 Europeans, and 2,000 Sepoys, and 1,500 of the Nawaub's cavalry. The French, 500 Europeans and 60 Horse Infantry, 2,000 Sepoys, and 4,000 Mahrattah Cavalry. The year was passed in fruitless, but bold attempts, on the part of the French, to seize Trichinopoly, and of the English, to induce them to raise the seige.—*Mill.*

Ahmed Shah, Emperor of Delhi, was deposed and blinded.—*Hamilton.*

1754.—Great discontent existing in Europe, at the wars carried on by the French and English, in India, while their respective nations were at peace. Commissioners were sent out to inquire into, and adjust the dissensions. On the 2nd August, M. Godheu arrived as Commissary, and settled with Mr. Saunders, Governor of Madras, a peace between the Companies. The English had succeeded in maintaining their ally, Mahomed Ally, on the throne; and had effected the ruin of Chunda Saheb; which results, added to their military successes, proved, that they had the advantage in the late operations. M. Dupleix was recalled, and badly received in France; but must have been an able, although an ambitious man. He left M. Godheu as Governor, and M. Bussy in great power, at the Court of Salabut Jung, the Subadar of the Dekhan.—*Mill. Orme.*

The king gave the royal assent to an act, in March, to punish mutiny and desertion, in the officers and soldiers, belonging to the East India Company.—*E. I. Chron.*

1755.—Notwithstanding the late peace, the rivals were still intriguing and interfering with the native powers. The English proceeded against Madura and Tinivelly. The French remonstrated and opposed them.—*Mill.*

1755.—A settlement at Negrais having been two years previous contemplated by Governor Saunders, Capt. Baker was, this year, sent on an embassy to Ava.—*Dalrymple.*

Mr. Geo. Pigot succeeded Mr. Saunders, as Governor at Madras.—*Dalrymple.*

1756.—Alumgeer assassinated. Ahmed Shah Abdelli first entered Delhi.—*Hamilton.*

Fredericksnagore (Serampore) founded by the Danes.—*E. I. Chron.*

Geriah, the stronghold of the Pirate Angria, attacked by Admiral Watson, and Clive, (just returned from Europe with the rank of Colonel;) it was carried on the 13th February, and much plunder obtained.—*Mill. Orme.*

On the death of Aliverdi Khan, Nawaub of Bengal, his grand nephew, Suraja Dowlah, succeeded. Immediately taking offence at the English, for their protection to a native officer, said to have escaped from Dacca, with treasure, he attacked Calcutta, carried it on the 20th June, after a poor defence, (Drake, the Governor, having fled to the shipping,) and allowed his officers to shut up 146 European prisoners, in a small military prison room called, the black hole*, in which 123 of the number perished, during the night.—*Stewart.*

Suraja Dowlah, on his return from Calcutta, exacted 4½ lacs of rupees from the Dutch, at Chinsurah, and 3½ lacs from the French, at Chandernagore. The latter had supplied him with powder.—*Stewart.*

Colonel Clive and Admiral Watson left Madras on the 16th October, with 900 Europeans, and 1,500 Sepoys, to inflict vengeance on the Nawaub; reached Fulta on the 20th December.—*Stewart.*

At this time, there were 70 houses only in Calcutta, and the present site of Fort William was a complete jungle.—*Hamilton.*

1757.—Colonel Clive retook Calcutta on the 2nd January, and forced Suraja Dowlah into a treaty, offensive and defensive, on the 9th of February.

On the 22nd March, Clive took Chandernagore, against Suraja Dowlah's wish, war having been proclaimed anew between the French and English.—*Stewart.*

Having made a secret treaty with Meer Jaffier, an officer of the Nawaub, Clive shortly staked every thing in a daring attempt to conquer Bengal itself. Thus refusing to return to Madras, as ordered, he advanced in June, towards Moorshedabad, the Nawaub's capital. On the 23rd June, he fought the battle of Plassey, against 18,000 horse and 50,000 infantry, and aided by the treachery of Meer Jaffier, routed the Nawaub's troops. Suraja Dowlah fled, but in a few days was seized, and cruelly assassinated, by order of Meer Jaffier's son. On the 29th June, Meer Jaffier was raised to the Musnud, and from that date, the influence of the British may be stated to have become paramount in Bengal.—*Stewart.*

During the operations in the Carnatic, on the declaration of war between France and England, Madura was taken by the English, under Captain Calliaud, on the 8th August, after that officer had successfully defended Trichinopoly. The French took Chittaput, Trincomalee, and sundry other forts.—*Mill.*

Manillah taken from the Spaniards, by the English.

The English established a Mint in Calcutta, and the first rupee was struck on the 29th of August.—*East India Chronologist.*

1758.—Count Lally, on the 25th April, landed at Pondicherry, as Governor General, and in three days, the fleet from which he disembarked, had an indecisive engagement with Admiral Pocock.—*Mill.*

Lally, who was haughty, impetuous, and unconcilating, was not disposed to look favourably on the successes of M. Bussy, in the Deccan, where the latter had been powerfully controuling the entire Subah. Bussy had possessed himself of the strong hold of Dowlatabad, and at the time of Lally's arrival, his influence was immense. He was now recalled, while the effects of his measures, and the French supremacy in the Councils of the Dekhan, were wholly ruined in consequence.—*De Bar.*

Fort St. David surrendered to Lally, on the 1st June, and on the 7th Devi-cottah was abandoned by the English.—*Mill.*

* It is to be regretted that the indefatigable and able Historian Mill makes this a handle for some of his wonted sarcastic abuse of the early English in India, and asks, what business had Fort William with a black hole? He might as well inquire, what right has the same fortress now, to possess solitary cells for the soldiery? The 'black hole' in question, was simply one of a range of godowns (warehouses) on the ground floor, built against a four-foot outer wall of the fort, the roof of the warehouse acting as a rampart, on which guns were placed,—the front of the godowns having a small verandah looking into the fort. There were two small windows to the godown which had simply been used as a lock-up house, or '*Black hole*,' for disorderly soldiers.

1758.—Colonel Clive, in Bengal, after much intrigue and difficulty, in realizing the sums exacted from Meer Jaffier for his exaltation, in October, on an opening held out by a Polygar Chief, for the expulsion of the French from that quarter, detached Col. Forde with a force, against the Northern Circars.—*Mill.*

Lally, in the Carnatic, disgusted every one, and having no funds or assistance, proceeded unwisely against Tanjore, to recover large sums, asserted to be due on treaty. He failed in an attack on its capital, and returning to Pondicherry, found that the French Admiral, after a slight discomfiture by the English fleet, had determined to proceed to the Mauritius. In vain Lally remonstrated, and from that time, his late high hopes and haughty expectations of success, failed him: still, with energy and ability, worthy of a better result, on the 14th December, he commenced the siege of Madras.—*Mill. De Bar.*

1759.—Lally obliged precipitately to raise the siege of Madras, on the 16th February; M. Bussy was taken prisoner during the siege.—*Mill. De. Bar.*

The troops, under Colonel Forde, sent round from Bengal against the Northern Circars, took Masulipatam on the 7th April. Salabut Jung, the Subadar, created by M. Bussy, on the reverses of the French, threw himself in the arms of the English. The power of Europeans in India was, by this time, so firmly rooted, that he was aware he could not sustain his rule in the Dekhan, without the support of one or other of the rivals.—*De Bar.*

The English, after a mutiny of the French troops, successfully attacked and carried Wandewash.—*De Bar.*

In Bengal, Col. Clive was threatened with a new enemy, the Emperor Alumgeer having invested his eldest son with the government of Bengal, and full powers to seize it; an army was formed, and attacked Patna, in its progress to Moorshedabad; but the Nawaub of Oude, deserting the Shahzada, and treacherously seizing Allahabad, in the rear of the royal army, Bengal was saved, and the prince obliged to throw himself upon Clive's protection. The Nawaub, Meer Jaffier, in gratitude, gave a Jaghire to Clive, worth £30,000 per annum.—*Mill.*

In August, a Dutch fleet, with troops, arrived in the Hooghly. Clive hesitated not to attack them, on the asserted behalf of Meer Jaffier, although at peace with Holland. This attack was successful, and the Dutch were forced instantly to retire with much loss.—*Mill.*

On the Bombay side, the Siddee, during an insurrection against him, resigned his government of the castle and fleet to the English, whose possession was confirmed by the Court of Delhi. This greatly increased our importance in that quarter.—*Grant.*

1760.—On the 22nd January, was fought the battle of Wandewash, by Colonel Coote, against Count Lally, in person. The Count had determined to make a stand, not only to restore confidence in his troops, but to save Arcot, if possible. He was defeated with heavy loss, and retired under the walls of Pondicherry. Arcot also fell.—*De Bar.*

Early in February, Clive resigned, meditating to retire with his fortune to Europe; he was succeeded temporarily by Mr. Holwell, until the arrival of Mr. Vansittart, in July.—*Mill.*

After Clive's departure, the Mogul's eldest son was again induced to invade Bengal; and on the assassination of the Emperor of Delhi, the prince being proclaimed in his stead, continued his advance on Bengal, with the imperial force. Colonel Calliaud had succeeded to the command of the British troops.—*Mill.*

An action took place near Patna, and a detachment under Lieut. Cochrane was cut up; but on the 22nd February, a general engagement was fought between the English force, with their Bengal allies under Meer Jaffier's son, and the Emperor: the latter was defeated. The Emperor next determined to push past the allies and seize Moorshedabad; but on the 7th April, he was overtaken by Calliaud, when he set fire to the imperial camp, and fled.—*Mill.*

In May, Captain Knox defeated the Naib of Purneah, who intended to have joined the Emperor.—*Mill.*

In October, Meer Jaffier was deposed as incompetent, and as guilty of enormities in his government of Bengal. He could not, however, fulfil his pecuniary and other engagements to the English, which was the main offence, and the justice of his deposition has been deeply questioned; some of Mr. Holwell's charges were afterwards entirely disproved.—*Mill. Grant.*

Mr. Vansittart raised the Ex-Nawaub's son-in-law, Meer Kasim, to the Musnud, who promised the fulfilment of all existing pledges, with other grants and advantages. He ceded the districts of Midnapore, Burdwan and Chittagong, to the Company.—*Grant.*

The French made a treaty with Hyder Ally, who marched to their aid at Pondicherry; but on the 4th September, the allies were completely beaten by the English, and Hyder Ally shortly afterwards withdrew.—*Mill. De Bar.*

1761.—After the bitterest disputes between the French and Lally, all parties being exasperated against him, Pondicherry was surrendered on the 16th January, to Col. Coote.—*De Bar.*

The English troops and navy wished to retain Pondicherry, for the king; but Mr. Pigot, the Governor, insisted on its being delivered over to the Company, or threatened to withhold all pay to the forces: it was given up to him, and he immediately destroyed its works and fortifications.—*Mill.*

The fate of Lally was melancholy. On his return to France, he was sacrificed by the Ministry; while the feeling against him aided the attempt of his enemies to fasten on him alone the obloquy of losing India to France: after four years' imprisonment, he was executed. Posterity have been more lenient, and reversed the opinion against him. Other causes, than the mere pride and rashness of an individual, were proved to have led to the destruction of the French empire in the Carnatic.—*Mill. De Bar.*

Major Carnac, who succeeded Col. Calliaud in the command of the troops in Bengal, arrived at Patna, early in January, and on the 15th, attacked and defeated the Emperor at Gya. M. Law, who, on the taking of Chandernagore, had proceeded up the country, to seek service with the native powers, was with the Mogul, and here taken prisoner.—*Grant. Mill.*

The new Nawab, Meer Kássim Ali, soon began to be impatient of his English friends, but wanting means to oppose them, he proceeded to Patna, to seize on the treasures of his deputy, Ramnarain. The vice Nawab solicited the aid of Major Carnac, and soon after of Col. Eyre Coote, who superseded Carnac; but they were prevented by the Council from protecting him, and he fell a victim to the rapacity of the Nawab.—*Mill.*

Other sources of dispute arose: the servants of the Company contended, that the firmaun of 1717, and the late treaties, authorised their own private trade to be free of duty. The Nawab denied this, and apparently with reason and justice; and strenuously opposed such special immunity to the English. He soon began to organise troops under Mogul officers, and removed to the Fort at Monghir.—*Mill. Grant.*

1762.—Messrs. Vansittart and Hastings repaired to the new residence of Kássim Ali, at Monghir, and the former treaties, relative to private trade, were modified; but the Council in Calcutta rejected the new terms, to the great indignation of the Nawab.—*Grant.*

The Philipine Islands taken by an expedition, fitted out from Madras.—*Grant.*

Kássim Ali renewed his remonstrances against the private trade of the Company's servants, and the disputes assumed a serious aspect.—*Mill.*

1763.—Messrs. Amyatt and Hay, sent on deputation to the Nawab, to insist upon continued immunity from duties. He refused; dismissing Mr. Amyatt, but retaining the other as a hostage. Mr. Ellis, the chief at Patna, at this juncture, widened the breach by his undisguised feeling of hostility to the Nawab. The latter had seized some arms on the way to Patna, and refused to deliver them. Mr. Ellis, on the 24th June, suddenly seized the Nawab's Fort, at Patna; but neglecting proper precaution and defence, it was retaken the next day, and all the English at Patna were seized as prisoners. The Nawab, on this act of hostility, sent after, and murdered Mr. Amyatt, on his way to Calcutta. These events led the Council at Calcutta, on the 7th July, to proclaim Meer Jaffier again as Nawab, deposing Kássim Ali. Meer Jaffier confirmed all existing treaties with the Company, besides according other advantages. Major Adams, on the 19th July, defeated a force of Kássim Ali, between Calcutta and Moorshedabad. On the 24th July, took Moorshedabad. On the 2nd August, routed a large force at Geriah. On the 5th September, stormed and seized the Fort of Oudenullah, defended by 100 pieces of cannon. Kássim Ali, incensed to madness at these reverses, and frantic under accumulated resentments and ruined ambition, fled to Patna, from Monghir, and there cruelly ordered the massacre of the English in his power: there were fifty gentlemen, Messrs. Ellis, Hay, Lushington, and others, and one hundred of lower rank. On the 5th October, they were brought out in parties, and barbarously cut to pieces, or shot under the direction of a German, named Sumroo. Monghir fell to the English early in October. Patna was stormed on the 6th November, and the Ex-Nawab fled to the Vizier of Oude, with his treasures, and the remnant of his army.—*Grant.*

Peace between France and England had been signed on the 10th February. The 11th article gave back to France all factories, in their then condition. France to erect no fortifications, and keep no troops in Bengal. To renounce all acquisitions on the coast of Coromandel and Orissa, and to recognize Mahomed Ali Khan as Nawab of the Carnatic. The peace honourable and advantageous to the English in India.—*Mill. Grant.*

About this time, the Madras presidency, finding itself unable to keep up the armies required in the Carnatic, openly insisted upon possessing from Mahomed Ali, some districts, with their revenue, for the purpose.—*Mill.*

Mr. R. Palk succeeded, 14th November, to the Government of Fort St. George.—*Dalrymple.*

1764—In the Carnatic, the English gradually assumed the Revenues. The subjection of Mahomed Issoof, of Madura, cost the Company and their Ally, the Nawab, a million, before it was finally effected in October.—*Mill.*

In Bengal, the British Army, in pursuit of Kássim Ali, advanced towards Oude, which also harboured the young Mogul. Major Carnac defeated the Vizier on the 3rd May, near Patna. Major, afterwards Sir Hector Munro, superseding Major Carnac, severely punished some mutinous conduct of the soldiery, and caused 24 Sepoys to be blown away in one morning, from the mouths of cannon. On the 23rd October, he fought the celebrated battle of Buxar, completely routing the Vizier's Army. The following day, the Mogul threw himself on the protection of the British, and joined their camp, with the imperial standard of Hindustan. The Army advanced to overrun Oude. The Vizier refused to deliver up Kássim Ali, though he had seized and plundered him; and had offered to assassinate Sumroo.—*Grant. Mill.*

Kássim Ali afterwards escaped into the Rohilla country, with a few friends and some jewels, which he saved from the fangs of his late ally, the Vizier.—*Mill.*

1765.—Meer Jaffier, worn out by ill health and affliction at the impossibility of meeting the pecuniary engagements with the English, sickened and died in January; Nujeem ad Doulah, next surviving son of Meer Jaffier, was appointed to succeed his father.—*Mill.*

Lord Clive returned to Bengal, being appointed Commander-in-Chief, President and Governor, in Bengal, with Messrs. Sumner and Sykes, as Members of the Select Committee. He arrived 3rd May, and assumed the Government on the 7th. General Carnac and Mr. Verelst, the other Members, were then absent on duty. The new covenants against presents were signed by the Company's servants, Civil and Military. The Bengal Army signed the covenant; but the General delayed the signature, pending a reference to Calcutta, receiving, in the interval, two lacs of rupees from the Emperor. The new Nawab of Bengal, on a fresh agreement, ratified on the 28th July, handed over all his Revenues, and the management of the Subadári; himself to have 50 lacs, subject to the controul of the Company's servants. In operations against the Vizier of Oude, Lucknow had been taken by Sir R. Fletcher, before General Carnac joined the army. Allahabad had fallen; Chunar held out: but on the 3rd May, General Carnac attacked the Nawab, at Corah, and routed him. On the 19th May, the Vizier agreed to come into the British camp, and was well treated. His dominions were restored. The English authorities did not insist on private trade or factories, in Oude; but Allahabad and Corah were retained for the Emperor, who himself was forced to give up all claim to arrears of Revenue, from Bengal, Behar, and Orissa; and finally, on the 12th August, His Majesty signed the perwana, granting to the Company, the perpetual Dewannee of these three Provinces. The private trade, so strongly prohibited by the Court, still partially retained; and under a public association, arranged by Clive himself—that of betel-nut, tobacco, and salt, the most valuable, engrossed by the public servants.—*Mill.*

The Northern Circars were given to the English in proprietary grant; but the cession took place on the following year.—*Grant.*

A dák established between Calcutta and Moorshedabad.—*E. I. Chron.*

1766.—From the year 1757 to 1766, it appeared, from Parliamentary documents, that £5,940,498 had been distributed to the Company and its servants, by the Princes and other natives of Bengal. By orders from Home, dated 1764, these presents were expressly prohibited, and Civil and Military servants were enjoined to pay to the Company all presents tendered by natives, which exceeded 4000 rupees.—*Mill.*

Count Lally beheaded, 5th May.—*Raynal.*

12th November, a treaty concluded with the Nizam, by General Calliaud. The Company to pay nine lacs for the possession of the Circars, and to furnish troops to the Nizam, if required, for the affairs of His Highness's Government.—*Grant.*

A serious mutiny broke out in the Bengal army, consequent to the reduction of double full batta. Formerly this allowance was paid by the Nawab; but the Company refused to continue it from the 1st Jan. 1766. Almost every officer resigned. Lord Clive met the exigency with his usual sternness and spirit: he brought officers from all directions, for the command and charge of the troops, induced some to retract, and cashiered others by Court Martial. Amongst the latter, Sir R.

Fletcher, known for his successes in Oude, was dismissed for not at first repressing the combination.—*Grant. Mill.*

1767.—On the 16th January, Lord Clive declared his intention to resign. On the 17th February, Mr. Verelst succeeded.

Presents having been forbidden, Lord Clive gave up a legacy of five lacs from Meer Jaffier, and adding to it three lacs, from Syeff-ul Dowla, the successor of Nujeem ad Dowla, formed the fund (called Lord Clive's fund) for invalided officers and soldiers of the Company's Service, and their widows.—*Mill.*

Abdulla Shah marched towards Delhi; after overruning some provinces, returned to his own country.

An expedition sent to Nepaul by the English, and failed.

The war with Hyder Ali broke out in the Carnatic, but the Anglo-Indian Governments were crippled for want of money. Lord Clive's splendid financial promises, and the hopes in England, regarding the riches of India, already proving fallacious. —*Mill.*

Notwithstanding the growing pressure for funds abroad, the Court of Proprietors at home increased the dividend to 12½ per cent. In consequence of this and other proceedings, the Restrictive Acts of the 7th of Geo. III. cc. 48, 49, and 57, were passed; by the last of these, the Sum of £400,000 per annum was to be paid by the Company to the Crown, for their new territorial acquisitions.—*Grant.*

1768.—Early this year, arrived the Company's peremptory order, entirely abolishing their servants' private trade in salt, and restricting them to the maritime branches of commerce. A commission of 2½ per cent. on the Dewannee revenues to be granted, however, in proportionate shares to the Governor in Council, Civil and Military servants of rank, with additional pay to Captains and Subalterns.

Great scarcity of treasure in Bengal.

On the Coast, the war with Hyder Ali was sustained with difficulty. This adventurous soldier, originally a common peon, next a petty officer, soon a commander of a few horsemen, and in charge of a small fortress—subsequently, a military retainer of the minister of the Mysore Sovereign, and leading a division of the royal troops—next, acting for himself, displacing his patron, and lastly, ejecting the pageant Hindu Prince of Mysore, and usurping the throne itself.—He was, by this time, the most formidable enemy the English had met with. In September, after some partial successes of the English, Hyder made overtures of peace; but the tenders were haughtily and unwisely refused.—*Mill. Grant.*

1769.—After the display of much military talent, Hyder Ali drew off the English army to a distance, and suddenly, with 6000 cavalry, appeared at St. Thome, in the immediate vicinity of Madras. He there imposed his own terms on the Government, who were forced, on the 4th April, into a peace, little creditable or advantageous to the British.—*Grant.*

In April an Act passed, that the territorial revenues should be held for five years by the Company.

Three commissioners were sent out to India, Messrs. Vansittart, Scrafton, and Ford; they embarked in September, 1769, on the Aurora frigate, and were never afterwards heard of.—*Grant.*

At this time it was proposed to send out a Naval Commander-in-Chief, with full political powers, on the part of the King; after much opposition, the measure was carried, and proved, for the short period that it lasted, very inconvenient. —*Mill.*

Mr. Verelst resigned in Bengal, 24th December, succeeded by Mr. Cartier.—*E. I. Chron.*

1770.—A dreadful famine in Bengal, one-fifth* of the population perished.—*Grant.*

On the 10th March, died Nawab Syeff-ul Dowla, of Moorshedabad; his brother, Mubarek-ul Dowla, a minor, succeeded. The Court of Directors reduced his allowance to 16 lacs per annum, during his minority.—*Mill.*

1771.—The Parliamentary restriction on the dividends ceasing in 1769, the Court, in March and September, notwithstanding their difficulties for money in India, again raised the dividends to 12½ per cent.—*Mill.*

In May, the Emperor Shah Alum unwisely left the protection afforded him at Allahabad, and aided by the Vizier and the Mahrattas, re-entered his capital at Delhi, on December 25th.

1772.—Mr. Cartier was succeeded (13th April) by Mr. Warren Hastings, in the Bengal Government.—*E. I. Chron.*

* Mill states the loss at ⅓ of the population.

On the 14th May, the collection of the Revenues in Bengal was undertaken entirely by the Company, who now stood forth as Dewan. In 1769, Civil Servants were appointed as Supervisors of the native revenue officers: and were henceforth to be denominated collectors. The lands to be let for five years—*Mill.*

The seat of Revenue business, and the Treasury, removed from Moorshedabad to Calcutta. The chief seats of civil, and, at first, of criminal judicature, likewise transferred to the Presidency, under the name of Sudder Dewanee Adawlut, composed of Governor and two councils for civil matters; and Sudder Nizamut Adawlut, for criminal proceedings, composed of native law officers, exclusively subject to review of the Governor and Council. Under these were District Courts, the Collectors having, at the same time, revenue and judicial authority.—*Grant.*

Mr. Hastings deposed Mahomed Reza Khan, from his high situation of Naib dewan, at Moorshedabad, and Raja Shetab Ray, the same at Patna, bringing both as prisoners to Calcutta, in April. Munny Begum, originally a dancing girl, appointed to the charge of the young Nawab, and the controul of the palace of Moorshedabad.—*Mill.*

The Mahrattas permitted to ravage Rohilcund.—*Mill.*

1773.—The financial distresses of the Company increasing, they applied to the British Minister for a loan. His Majesty's Government, finding the feelings of the country alienated from the East India Company, by their improvidence, and stated mismanagement, brought in the important *Regulating Act* of 1773, (13 Geo. III. *c.* 63,) appointing a Governor General and four Members of Council, for five years, to Bengal; Mr. Hastings to be Governor; Mr. Barwell, Senior Member; and Lieutenant General Clavering, Colonel Monson, and Mr. Philip Francis, Members. The constitution of the Court of Directors was altered; an annual election of six Directors for four years ordained: a year to elapse before an Ex-Director could be eligible. Qualification for a Proprietor now raised to £1000. The Crown also assumed, formally, a privity and controul in the affairs, financial and political, of the Company. The Mayor's Court was abolished at Calcutta, and Supreme Court of Judicature established. The Judges to be sent from England. Similar steps were subsequently pursued at the other Presidencies.—*Grant.*

The English entered into a treaty with the Nawab of Oude, for the destruction of Rohilcund; the Nawab to support the charge of the British army. A garrison thrown into Allahabad; and a Member of Council sent to take charge of the revenues. The Emperor of Delhi left to his fate, amidst the aggressions of the Mahrattas: and Corah and Allahabad handed over by the English to the Nawab.—*Mill.*

In *Bengal*, in 1773-4, the revenues were £2,481,404
The Civil and Military charges were .. 1,488,435

The Army, about this time consisted of Artillery, five Companies; Cavalry, one Troop; European Infantry, three Regiments; Native Infantry, 23 Battalions; and 28 Companies of Invalids; total, 27,000 men.

Fort St. George, revenue and subsidies, £887,302
The charges were 814,992

The Army—(1772)—European Infantry, 3,486; European Cavalry, 68; Artillery, 581; Sepoys, 15,840; total, 19,975.

Bombay (1773-4), revenues, ... £109,163
Charges, ... 347,387

The Army—Artillery, 434; European Infantry, 1,620; Sepoys, 4,346; total, 6,400.—*Grant.*

War anew with Tangier; the English and their Ally, the Nawab of the Carnatic, being dissatisfied with the terms obtained in 1771. On the 16th September, Tangier was carried by storm, and the Rajah and family taken prisoners in the fort. He was dethroned, and his territories seized by the Allies.—*Mill.*

1774.—Colonel Champion, Commander-in-Chief in Bengal, assumed the command of an army in Feb., destined to act against the Rohillas, in alliance with the Nawab Vizier. On the 23rd April, (known as the battle of St. George,) he defeated 40,000 Rohillas, under their Chief Hafez, near Babul nullah. The Vizier kept aloof; but after this victory, (which led to the termination in July, of the first Rohilla war,) he plundered and despoiled the whole country.

The new Counsellors, General Clavering, Mr. Monson, and Mr. Francis, arrived in Calcutta 19th October. Mr. Hastings assumed the title of Governor General, now first authorized; but discussions immediately arose between himself and colleagues. Mr. Hastings and Mr. Barwell were in the minority; thus the new counsellors wielded the powers of the Government.—*Mill.*

Collectors' Courts abolished, and Provincial Councils established at Calcutta, Burdwan, Dacca, Moorshedabad, Dinagepore, and Patna, to superintend the joint Departments of Revenue, Trade, and Administration of Justice.—*Grant.*

23rd November, Lord Clive died in London, aged 49.—*E. I. Chron.*

1775.—Died Sujah ud Dowla, the Vizier of Oude, succeeded by his only son, under the title of Assoff ud Dowla.

The Bombay Government, previous to this period, had interested and mingled themselves much with the politics of the Mahrattas; and were about this time in alliance and support of Ragoba, the Ex-Peishwah. On the 28th December, 1774, a force from Bombay had seized and occupied the Island of Salsette; and a force under Col. Keating, having effected a junction with Ragoba, the allied army was attacked by their Mahratta enemies, on the 18th May, 1775, at Arras; when the British and their Allies, after much loss, were victorious. At this juncture, the Bengal Government, now supreme, interfered to disapprove of the connection of the Bombay Presidency with any of the Mahratta powers, and insisted on an immediate cancelment of the treaty with Ragoba, (by which Salsette, Basseen, and part of the revenues of Baroach, had been secured to the Company,) and on the withdrawal of all the British troops furnished for his assistance.

The Court's despatches of this year, it is curious to state, approve of the acts of the Bombay Government, at the very time they were ordered to be annulled by the Supreme Authority in India.—*Mill.*

The Court in England, displeased at the late war and results, in Tanjore, determined on the reinstatement of the Rajah; and Lord Pigot was sent out to give effect to this, and other measures, at Madras. He arrived as Governor, 11th December, 1775.—*Mill.*

1776.—The Supreme Government deputed an Envoy of their own, Col. Upton, to Poona; after much unsatisfactory negotiation, the Council decided on a war with the Mahratta confederates, and on the support of Ragoba—both of which had been the subjects of their severe condemnation, the preceding year; but on further negotiation, by Col. Upton, a new treaty, (called that of Poorunder,) was obtained, still leaving Salsette to the English, but not so favorable as that secured at Bombay. Ragoba was now left to his fate, and retired to Surat with only 200 followers.

Dissensions ran high between the Governor General and his Council; charges of bribery and corruption were brought against Mr. Hastings, at the Council Board itself. He indignantly dissolved the Council on each occasion of their being preferred there. Nuncomar, a native of rank, implicated in preferring these charges, was convicted of forgery, at the Supreme Court of Judicature, by a Jury of Englishmen, and hanged. This act much condemned.

In November, Colonel Monson died, which restored to the Governor General, the majority in the votes at Council, and gave him again the direction of the Government.—*Mill.*

The Tanjore Rajah restored. Lord Pigot and the Council of Madras had violent disputes; and on the 24th August, the Council arrested the Governor, stripping him of all authority. He died in restraint, on 31st August, of the following year. The four Members of Council, who committed this violence, were subsequently tried at home, found guilty, but fined only £1000 each.—*Mill.*

1777.—The quinquennial settlement at Bengal having expired; and both Mr. Hastings and Mr. Francis, having meanwhile submitted able revenue plans, (both differing, and neither of them adopted by the Home Authorities;) the annual leases were again put in force, and were continued for four years.—*Grant.*

1778.—The treaty of Poorunder, (Col. Upton's,) not proving satisfactory, and part of the Mahratta confederates having resolved to support Ragoba, the English were applied to again to aid him. The Governor General assented, and six Battalions of Sepoys, one Company of Native Artillery, and a Corps of Cavalry, assembled at Culpee, under Col. Leslie, with orders to march towards Poona, through Berar.

The French, at this period, had much influence at Mysore; attempted, through Agents, to obtain footing and influence among the Mahrattas.

Sir Thomas Rumbold succeeded to the Government of Fort St. George, in February. His acts gave much dissatisfaction to the Home Authorities, particularly as regarded his alleged corrupt installation of Sitteram Ráz, in the Dewanee of the Guntoor Sircar.

War breaking out between England and France, the French factories of Chandernagore, Masulipatam, and Carical were occupied without resistance. Sir E. Vernon, with a British squadron, engaged that of the French, under M. Tronjolly, 10th August, and dispersed the latter. Pondicherry was invested, in September, by land, under Sir Hector Munro, and by the English fleet, by sea. After a gallant defence, under M. Bellecombe, it surrendered on the 17th October, and its works were again razed.—*Mill.*

1779.—A Force from Bombay, in support of Ragoba, impeded by the blunders of Civil Commissioners placed in controul of it, got into difficulties, and commenced a disastrous retreat, when only 16 miles from Poona. Negotiation was commenced under these unfavorable circumstances with the confederates, and a treaty signed,

by which much of the acquisitions of the English, in that quarter, was relinquished.

Col. Leslie, commanding the Bengal force, having died the year before, General Goddard assumed the command, and after much difficulty, and under conflicting orders, marched 300 miles in 19 days, across India, reaching Surat on the 30th January. He was now invested by the Supreme Government with full powers, to treat with the Poona Ministry. After much ineffectual discussion, hostilities were resumed at the close of the year.

Sir Eyre Coote succeeded General Clavering, as Commander-in-Chief at Bengal, and Member of Council in April.

The Supreme Government disapproved of Sir T. Rumbold's acts at Fort St. George; he indignantly repelled the interference.

The French settlement of Mahe taken by Col. Braithwaite, 19th March of this year, although Hyder Ali remonstrated against the act; Mahe being useful to himself.—*Mill.*

1780.—General Goddard carried Ahmedabad by storm, on the 15th February; and on the 3rd April, surprised the camp of the Mahratta confederates, and dispersed them.

In the rainy season, Scindia and Holcar withdrew into their own countries. But the most brilliant event of this year was the assault and capture of Gualior, on the 3rd August, by Capt. Popham, with a small detachment, intended to augment the forces of Goddard.

A duel took place between Mr. Hastings and Mr. Francis, the latter having been accused of breach of faith—he was wounded: he embarked for England on the 9th December.

Hyder Ali, who for some time had been regaining his power, consolidating his means, and disciplining his army, by means of French officers, incensed at the capture of Mahe, contrary to his wishes, put his troops in motion, in June, and had entered into a treaty with the Mahrattas, against the English. The Government at Madras were struck with alarm, being without troops, money, or military means. Hyder's army now advancing was 100,000 strong; 20,000 of them disciplined, and commanded by the French. They spread devastation and ruin, around the precincts of Madras, while Sir Hector Munro had no force, to make head against them. Arcot was invested by the Mysoreans. Col. Baillie's detachment was overpowered and cut to pieces on the 9th September; and Sir H. Munro, who had advanced to his relief, forced back to the mount, from Conjeveram. The Supreme Government now interposed. It sent round Sir Eyre Coote, by sea, in October, with treasure and troops, detaching a body of Sepoys by land. Mr. Whitehill, who had succeeded Sir T. Rumbold, as Governor, on his removal in April, was suspended by the Bengal Government, Mr. Charles Smith taking his place, 8th October; and Sir Eyre Coote, notwithstanding Arcot had by this time fallen, soon was prepared to enter into operations against the formidable enemy now opposed to the British.—*Mill, and others.*

At Bombay, the Government, under considerable financial difficulty, was obliged to contract new debts, to enable General Goddard, with his contingent force, to act with efficiency. In October, he moved from Surat, with reinforcements of Europeans from Madras, against Basseen. On the 10th December, when a practicable breach was nearly effected, the fort made an offer of surrender, which was carried into effect on the following morning.—*Mill.*

This year an act was passed at home, similar to one of the preceding session, permitting a dividend of 8 per cent. for the year, reserving the surplus profit for the future disposal of the legislature.

At Bengal, the new Supreme Court, from its constant pretensions and attempts, for some years, to extend its jurisdiction, had occasioned much inconvenience to the Government, and subjected the native community to distress, by the introduction of legal proceedings, affecting the property and persons of inhabitants of remote provinces, never contemplated to be amenable to its power. The situation of the Company with native princes, and the treaties with the Nswab or others, were utterly disregarded by the Court. The Cauzee of the Patna Court, in 1777, was seized for acting upon the regulations of Government; and the decision of the Company's Court reversed. The Cauzee died under imprisonment. In the same year, a process was violently served on the Dewan of the Foujdaree Court, at Dacca, and some members of the Foujdar's family dangerously wounded in the affray. At length, 1779, a suit was commenced against the Rajah of Cassijurah, writs were issued, and the Rajah's zenanah forcibly entered, and his effects plundered. The Government now summarily interfered; the Military at Midnapore were ordered to intercept the Sheriff's party. Matters were thus at once brought to issue. A summons, on the Governor General and Council, was served on them individually, and they, of course, refused, by their counsel, to submit to any such proceeding of

the Supreme Court. At length, (24th October, 1780,) a means of reconciliation with the Judges was adopted, by appointing Sir E. Impey, to be Chief Judge, also of the Sudder Dewannee Adawlut, with an additional salary of 60,000 rupees per annum. This appointment was deemed most exceptionable on general principles, notwithstanding the admitted advantage of his professional knowledge, and that he reformed and methodised the practice of the Dewannee Courts.—*Mill. Grant.*

1781.—At Bengal, in April, the Dewannee Courts were increased from 16 to 18; and the Foujdars, or Native Magistrates, were this year removed. In February, Mr. Hastings had decreed, that a Committee of Revenue should be established at the Presidency, consisting of four covenanted servants, and Provincial Councils were abolished. After these changes, the Governor General proceeded, in August, to Benares, determined to adopt measures against the Rajah Cheyte Sing. Demands were made upon him for additional tribute to be paid to the Company, as the sovereign power now requiring assistance in its exigency. The Rajah declined, pleading willingness, but inability. He was seized by Mr. Hastings' order, at Benares: a revolt took place in his behalf, on the 20th August; nearly two companies of sepoys, and their officers, were destroyed—and the Rajah escaped in the confusion. The Governor General immediately assumed controul of the province; and troops were called in to oppose the Rajah, who now headed the numbers flocking to his support. He was defeated at Lutteefpore—and lastly, his stronghold of Bidjegur was seized, and his family plundered by a force under Major Popham. The Rajah had fled, on his reverses at Lutteefpore, to Bundelcund. After these transactions at Benares, the Governor General proceeded to Oude, to obtain an adjustment of the heavy debts due to the Company by the Vizier. The territories of the Begums, (one, the mother of Sujah ud Dowlah, the late Nawab—the other, the mother of the present one,) were seized, on a charge of aiding the insurrection of Cheyte Sing, and in an arrangement with the Nawab Vizier, their revenues and property were appropriated towards the redemption of the Nawab's debt to our Government.

Madras.—On the 17th January, the army, under Sir Eyre Coote, marched from the Mount, and proceeded to Pondicherry, where the General disarmed the inhabitants. The French fleet was off that town, but being in want of water and necessaries, and unequal to cope with the expected English squadron, it sailed on the 15th February, for the Isle of France. The English fleet now attacked Hyder's new shipping, and destroyed the germs of his maritime power, at Calicut and Mangalore. On the 1st July, Hyder, emboldened by a partial repulse, suffered by the English General, at Chellinbram, in June, risked a general engagement at Porto Novo, and was completely routed. Hyder abandoned now his designs on the southern provinces; his son Tippoo raised the siege of Wandewash—and both retired to Arcot. On the 27th August, another battle took place, at the place where Baillie was defeated. The result was indecisive, though victory was claimed by both armies. The English troops were in great difficulty for pay and provisions. But on the 27th September, Hyder suffered farther loss at the pass of Sholinghur; and in October, his fortress of Chittore surrendered. On the 21st November, the English returned to cantonments, having lost one-third of their force in this campaign. During the year, Lord Macartney had assumed the Government, on the 22nd June; and putting himself at the head of the Militia, he took Sadras and Policat, on the breaking out of war with the Dutch. On the 12th November, Negapatam capitulated to Sir H. Munro, (who had left Sir Eyre Coote in disgust, and now commanded a force under the orders of the Governor,) and with it fell all the Dutch settlements on the coast;—shortly afterwards, those on Ceylon shared the same fate.

On the 9th April of this year, Lord North brought forward, at home, some propositions restricting the Company, and bringing their affairs more under the controul of the Secretary of State. Though not adopted at this period, yet on these were afterwards based three principal provisions of Mr. Pitt's East India Bill. Lord North's suggestions were modified into the Act 21, Geo. III. cap. 65; and all former privileges were granted to the Company until the 1st March, 1791. But all despatches on Revenue or Civil and Military matters were, by this Bill, to be submitted to the Minister.

Parliamentary attention was now much directed to Indian affairs. Two Committees were formed: in one of them Mr. Burke became conspicuous—in the other, Mr. Henry Dundas. By a Bill passed on the 19th June, the Jurisdiction of the Supreme Court in India was restricted. The Governor General, and Council, with all matters of Revenue, all Zumeendars, Native Farmers, and Collectors of the Revenue, were exempted from its jurisdiction.—*Mill.*

1782.—Madras.—The campaign against Hyder commenced, by the English throwing supplies into Vellore. The English fleet, under Sir E. Hughes, and the French under the famous Suffrien, had an indecisive action on the 17th February. The French

Admiral contrived, however, to land 2,000 men at Porto Novo. From the 16th to the 18th February, Colonel Braithwaite's detachment bravely and perseveringly withstood incessant attacks from a combined force of French and Mysoreans, under M. Lally and Tippoo; but was, at length, forced to surrender. Tippoo treated the prisoners well. Cuddalore yielded to the same combined force on the 3rd April. On the 12th April, the French and English fleets again engaged; and though the fight commenced under most disadvantageous circumstances for the English, they disabled the enemy, and both fleets lay for seven days within random shot, unable to assail each other; they then mutually retreated. Hyder, in June, dexterously manœuvred with a detachment of his army, and carried off his treasure from Arnee, where it was threatened by Sir E. Coote. On the 29th June, news came of a separate treaty with the Mahrattas, made by the Supreme Government at Poona, on the 17th May, putting an end to all operations in that quarter. A negotiation was commenced also with Hyder, who again out-manœuvred the General, and was only prevented from reducing Negapatam, in a plan of combined operations with Suffrien, by the latter again encountering the English fleet on the 4th July; the French Admiral was able, however, to retake Trincomalee, on the 31st August, the English fleet heaving in sight, just two days after its surrender, when a gallant action was fought,—and Suffrien broke six of his Captains, for not supporting him. Sir Eyre Coote, by this time, was seriously ill, at Madras; and the Government there under much alarm: their means were reduced to the lowest ebb, and their food even limited to 30,000 bags of grain, lying in the roads, unequal to a month's supply. At this crisis, on the 15th October, the Admiral quitted them, and the following day, a storm either sunk or stranded the craft containing the grain. Famine now raged awfully: Sir Eyre Coote still sick: no longer equal to command, sailed for Bengal, and General Stuart succeeded to the head of the army, with provisions only for a few days, and its pay six months in arrears.

On the 7th December, Hyder Ali died, and Tippoo, (who had been detached against Colonel Humberstone, whom he vigorously attacked in conjunction with Lally, though the Colonel bravely withstood and repelled him,) hearing of his father's death, joined the main army, and was, in a few days, firmly established on the throne. He now took the field in December, with 900 Europeans, 250 Topasses, 2,000 Sepoys of the French allies, with countless hosts of Mysoreans—while the English Carnatic force amounted only to 2,945 Europeans and 11,545 Natives.

In Parliament, Mr. Dundas moved the recall of Mr. Hastings; it came to no result, but on the 3rd May, an address to the King was carried, that His Majesty would be pleased to recall Sir E. Impey, to answer for his conduct in accepting a situation under the Bengal Local Government.—*Mill.*

1783.—Madras.—The English army early commenced the campaign; but found that Tippoo was retiring from the Carnatic, being recalled in Mysore, not only to consolidate his government, but to defend his territories against an incursion of the English, under General Matthews, in Bednore. The General had reached Bombay, from home, with reinforcements for India, and immediately advanced as above. Tippoo suddenly, in April, appeared against him, retook Bednore, cut off the retreat of the detachment: their resources ceased—and without food or ammunition, they surrendered to him on the 30th April. The General and troops were afterwards cruelly treated. Discussions had arisen at Fort St. George, between General Stuart and the Government, and the army remained inactive till June, when it attacked Cuddalore, and failed. The English fleet offered battle on the 22nd June to Suffrien, which the latter seemed to have declined, but immediately landed troops at Cuddalore, where the French were already more than superior to the English opposed to them. Just as the French were meditating an effective attack, peace was announced from Europe, between France and England—and the French seceded from their operations on behalf of Tippoo. At this period, General Stuart was placed in arrest, by the Government; but Colonel Fullarton, who, with a separate detachment, was successfully carrying on operations in the southern provinces, was able to threaten, in November, even Seringapatam itself. He was checked only in his successful advances by negotiations for peace entered into with Tippoo.

Bengal.—Mr. Hastings was occupied with measures regarding the Vizier of Oude. The English residency was experimentally withdrawn, on the 31st December, under much asserted intrigue and cabal.

At home, Mr. Fox proposed a Bill for Indian affairs; it had in view, the abolishment of the Courts of Directors and Proprietors. Seven Commissioners were to be appointed by the Legislature, to manage the political, and nine Directors, to be selected by the Proprietors, to conduct the commercial concerns. It created great alarm, and the King interposed to effect a majority against his Minister.

Sir T. Rumbold, late Governor of Madras, was arraigned before Parliament; but the doubtful situation of the Rockingham Ministry prevented the proceeding coming to a result.—*Mill.*

1784.—Madras.—After some delay, peace with Tippoo was signed, (11th March,) on the general condition of a mutual restoration of conquests—it was ratified from Calcutta, Mr. Hastings being then at Lucknow: but no cordiality subsisted between himself and the Madras Governor, and he afterwards disapproved of the treaty, and insisted upon other terms. Lord Macartney, on his own responsibility, gave in the original treaty to Tippoo; nor did the Governor General resent the disobedience any more than he did that of the preceding year, when Lord Macartney refused to surrender the Assignment of the Carnatic territory to its Nawab, when ordered by the Governor General, on a reconsideration of the measure, to give up the Revenues and Government now formally assumed by the English.

Bengal.—In February, the Governor General again proceeded to the upper provinces. He imprisoned, at Benares, the Native Deputy placed over the territories of the deposed Cheyte Sing, for misconduct in the administration of the province. At Lucknow, he succeeded in obtaining more of the debt due to the Company; relieved the Vizier of the burthen of a detachment of the army, under Colonel Sir John Cummings; and finally restored in part to the Begums, as commanded by the Court of Directors, the Jaghiers which had been taken from those Princesses. He returned to the presidency in November.

The defeat in Parliament of Mr. Fox's Bill for India, in the preceding year, having been followed by the loss of office, Mr. Pitt, his successor, procured, on the 13th August, 1784, the passing of an Act modelled by himself, but partaking of the provisions suggested by Lord North. Its grand enactment consisted of Ministerial Commissioners, forming a Board of Controul; its minor features were a secret Committee of Directors; less power to the proprietors; a provision for ascertaining the fortunes amassed by public servants in India; and a tribunal for the trial of offences there committed by them.—*Mill.*

1785.—Mr. Hastings on the 8th February, resigned the Government, and embarked for England. In 1772, on the commencement of his administration, the Revenues under Bengal were, £2,373,650; the Civil and Military charges, £1,705,279; difference, £668,371. The debt in India was, £1,850,166; in England, £12,850,166. In 1785, the receipts under Bengal, had increased to £5,315,197; the expences were, £4,312,519; difference, £1,002,678. But including the Home debts, it appears, that in 1786, on bringing all arrears to account, 12½ millions had been added generally to the Company's debt during the period under review.—*Mill.*

1786.—Lord Cornwallis was appointed Governor General and Commander in Chief September 12. Courts of Dewannee placed under Collectors. Three Bills passed to amend late Act, a fourth also passed.—*Mill.*

1787.—Mr. Hastings impeached in Parliament—impeachment of Sir E. Impey negatived. New Code of Judicial Regulations passed by Lord Cornwallis.—*Mill.*

1788.—Mr. Pitt's declaratory Act brought before the House. Hasting's trial commenced 13th February. Emperor Shah Aulum dethroned, and afterwards blinded by Gholam Kadir.—*Mill.*

1789.—Lord Cornwallis' revenue reforms and decennial settlements (afterwards perpetual) commenced. Tippoo's operations against Travancore.—*Mill.*

1790.—Administration of Criminal Justice assumed throughout Bengal provinces. Tippoo's aggression in Travancore led to war with the English, and an alliance was entered into by them with the Nizam and Mahrattahs. General Meadows took the field—war varied in success. Revenues and Government of Nawab of Carnatic resumed by the English.—*Mill.*

1791.—Lord Cornwallis assumed the command at Madras against Tippoo. Bangalore carried by storm 21st March. Battle of Aukera 15th May. Hoolydroog taken 19th June, and afterwards Mendry Owog, Savendroog, and Onadroog stormed. —*Mill.*

1792.—Tippoo beaten near Seringapatam, 6th February. The place immediately invested; operations ceased on preliminary of peace 24th February. Half of Tippoo's territories to be ceded; two sons given as hostages. Peace concluded 19th March.—Col. Kirkpatrick's Embassy to Nepâl.—*Mill.*

1793.—French settlements taken on breaking out of Republican war. Permanent Revenue settlement carried into effect by Governor General. Financial and Judicial functions disjoined in public officers. Zillah Courts instituted. Provincial Courts of Appeal ditto. Criminal Courts and Circuits appointed. Marquis Cornwallis resigned 28th October. Sir John Shore succeeded as Governor General. Charter renewed to East India Company for 20 years.—*Mill.*

1794.—Sir W. Jones died April 27. Tippoo's sons restored.—*Mill.*

1795.—Warren Hastings acquitted April 23, after trial of 7 years—all the Dutch possessions at Ceylon and on the Indian continent fell to the English. Mahomed Ali of the Carnatic died.—*Mill.*

1796.—The Indian Army re-organised.—*Mill.*

1797.—East India Judicature Bill passed the Commons 10th July. Lord Mornington appointed Governor General 24th October—Lord Clive to Madras, December 13th.—*Mill.*

1798.—Vazeer Ali of Oude deposed—Saadut Ali proclaimed. Sir J. Shore resigned March 12th. Lord Mornington arrived May 18th. Treaty with Nizam, who disbands body of French Troops.—*Mill.*

1799.—Vazeer Ali's insurrection at Benares, January 14th. War declared against Tippoo for intrigues with the French, February 22nd. Seringapatam taken by storm May 4th, and Tippoo killed. Mysore divided. Thanks of Parliament voted October 4th. Lord Mornington created Marquis Wellesley, December 2nd.—*Mill.*

1800.—Act passed for regulating Governor of British India, July 28th. Marquis Wellesley made Captain General and C. C. in India, August 7. College of Fort William instituted, August 18.—*Mill.*

1801.—Lord Lake arrived as Commander in Chief. Supreme Court instituted at Madras, and Charter read, September 4.—*Mill.*

1802.—Large cessions enforced from Nawab of Oude, with the deposition of Nawab of Furuckabad. Powers of Arcot, Tanjore and Surat had been deposed. Subsidiary treaties attempted with the Mahrattahs. Treaty signed with Peshwah at Bassein.—*Mill.*

1803.—Possession of Pondicherry, which had been given up on Peace of Amiens, recovered by the English. Bonaparte had sent out several general officers, and others with 100,000 in specie. Mahrattah powers opposed to Treaty of Bassein. War with Scindia and Berar Rajah. Lord Lake marched against M. Perron, who retired from Scindia. Aligur taken by assault, 4th September. Battle of Delhi 11th. Battle of Saswarie (Lord Lake) 31st October. Battle of Assye (Sir A. Wellesley) 23rd September. Battle of Argaum (ditto), 29th November. Province of Cuttack taken possession of in October. Peace with Berar 17th December—Peace with Scindia 29th December.—*Mill.*

1804.—War against Holkar. Monson's retreat July and August, brave defence of Delhi for 9 days in October. Shah Aulum restored to nominal sovereignty at Delhi. Battle before Deeg 13th November. General Fraser wounded mortally. Holkar's Cavalry pursued during November. Deeg fell 24th December.—*Mill.*

1805.—Bhurtpore invested, assaults failed on the 9th and 22nd January and 20th February—Siege intermitted, and treaty with Bhurtpore 10th April. Cornwallis arrived again as Governor General and Commander in Chief 30th July. Policy toward Native Powers changed. Lord Clive died 5th October. Treaty with Scindiah 23rd November, and with Holkar 24th December.—*Mill.*

1806.—Shah Aulum dies—succeeded by Akbar Shah.—*Mill.*

1807.—Mutiny of Native Troops at Vellore, January 31st.—*Mill.*

1807.—Lord Minto assumes the office of Governor General, on July 31.—*(Comp. to Alm. 1832.)*

1808.—War with Travancore occasioned by a misunderstanding between the British Resident and the dewan of the Rajah. Troops sent from Trichinopoly on the 30th December. Col. Chambers repulsed a body of Travancore Troops, and Colonel Hamilton another body at Anjuncha on the 31st December.—*(Comp. to Alm. 1832.)*

1809.—(Madras.) Travancore Army again defeated, January 15th. The lines of Travancore stormed on the 10th February. Papanaviram captured on the 17th, and the whole of the lines on the 21st, which ended the war.

In consequence of offensive regulations, considerable disaffection arose in the Madras army—on the 5th of August, Lord Minto sailed for Madras to suppress it. On the 6th August, the Troops at Chottledroog seized the Military Treasure, and marched to join a force at Seringapatam, which had seized the garrison. On the 23rd August the disaffected troops at Seringapatam surrendered—Lord Minto published an amnesty on the 25th September*.

(Bengal) Adjygurh in Bundlecund stormed 13th February. Bowannee, a Fort in Hurriana, reduced on the 29th August, the chief having plundered the British.

In October assistance was given to the Rajah of Berar against the exactions of Ameer Khan, a predatory Mohammedan chief connected with Holkar. Ameer Khan was expelled from Berar.—*(Comp. to Alm. 1832.)*

* The compiler of this Table had proceeded thus far when he found his task had been anticipated in a great measure by "Chronogical account of connexion between England and India," which was published at home in the "Companion to the Almanac" for 1832. As usefulness is the only aim of a mere compilation such as this professes to be, the compiler has availed himself gladly of the new Table from 1807, and endeavoured to render his own more correct. This table, however, in earlier events is much fuller than that in the Companion to the Almanac.

1810.—Amboyna surrendered to the British, 17th February, followed by other islands. Banda taken August 9. Ternate August 29th.

Troops under Col. Keating landed at Bourbon July 7th, which fell on the 9th. The Mauritius surrendered on the 3rd December to an expedition from India under General Sir R. Abercrombie.—*(Comp. to Alm.* 1832.)

1811.—Expedition from India under Sir Samuel Auckmuty landed in Java on the 4th August. On the 8th, city of Batavia surrendered—on the 10th followed the action at Weltervreden. On the 26th the entrenched camp at Cornelis was carried by assault, and with this action ceased the Dutch sovereignty of Java.

1812—The Pindarees—large bodies of free-booters—began to be independent of their Mahratta patrons, and plundered part of the district of Mirzapore. Subsidiary alliance formed with Anund Rao Guikwar, Rajah of Baroda.—*(Comp. to Alm.* 1832.)

1813.—Governor General sends a letter, June 4th, to the Rajah of Nepál, demanding redress for repeated depredations of the Nepálese.

July 21, (Act 53 Geo. c. 155,) passed, renewing the privileges of the Company for 20 years. By this act the trade to India was thrown open, that to China alone remaining exclusively with the Company. The territorial and commercial affairs now separated; the accounts to be rendered distinct. The king empowered to create a Bishop of India, and an Archdeacon for each Presidency, to be paid by the Company.

The Earl of Moira assumed the Government as Governor General and Commander in Chief.—*(Comp. to Alm.* 1832.)

1814.—On the 29th May, the Nepálese attacked three British Tannahs at Bootwooh and murdered the Darogah. For this and other acts the Governor General declared war on the 1st November. The English troops at first beat back at Mollapannee, were repulsed with loss, and General Gillespie killed on the 31st November. Col. Bradshaw attacked and carried the post of Bushurwa, 25th November, and Lieut. Boileau, in personal conflict, killed the Goorka Commander. Major Ludlow's detachment was defeated at Jythug at the end of December.—*(Prinsep.)*

1815.—1st January, Captain Blackney's and Captain Sibley's detachments cut up by the Goorkahs near the Terraee Forest. 3rd January, Major General J. Sullivan Wood beat back at Jeetgurh. 10th February, Major General Marley suddenly relinquished his command of the army in the Terraee; he was succeeded by Major General Sir G. Wood, who also failed to advance. In February and March, Col. Gardner with a body of Rohillahs penetrated into Kumaon, and was successful in retaining a footing. Major Hearsey attempted the same, but was overcome by numbers and made prisoner. Colonel Nicolls, with a regular sepoy force, proceeded to the support of Col. Gardner, and on the 27th April, Almorah and the province of Kumaon formally surrendered to our arms in consequence of his successes.

The Goorkah General Umar Sing defeated on the 15th and 16th April at Deolul, by Sir D. Ochterlony; and on the 15th May, being completely outmanœuvred by that enterprising officer, surrendered Maloun, and all the provinces from Kumaon westward; this finished the first campaign.—*(Prinsep.)*

1816—The Nepál General had sued for peace, but in their uncertain councils withheld the promised ratification, and hostilities re-commenced in February. Sir D. Ochterlony on the 14th and 15th February turned in person the position of Chooreah, and his army passed the first barrier of hills in progress to the capital, Catmandoo. On the 28th February a general engagement ensued, and the Goorkahs were defeated with loss. Peace followed, the Nepálese agreeing to receive a Resident, and sacrificing much territory.

During this war, it was discovered that the Mahrattas were anxious to confederate against the British, while Runjeet Sing had a large army threatening the protected Seiks. Ameer Khan also had an immense body of Patans ready to act against our Agra frontier. In fact a general rising was contemplated, and Lord Hastings prepared accordingly. The Pindarees were now to be extirpated for the immediate safety of our provinces. The Mahratta powers consisted at this juncture of Scindia, sovereign of the states so called; Bajee Rao, the Peshwah and head of the Poonah states (who had early betrayed his hostility by murdering, through his minister Tumbuctjee, an envoy acting under the British guarantee); and Holkar, head of the dominions called after that family, and the Nagpoor Rájah, Appah Sahib. *(Prinsep.)*

1817.—The supposed impregnable Fortress of Hattras fell (February 23rd), after a heavy bombardment.

Appah Sahib, notwithstanding a late treaty with the British, was deeply entriguing and collecting troops; Bajee Rao was also arming extensive levies, and sent off his family and treasures from Poona. Mr. Elphinstone called in a British force and invested Poona on the 8th May, and Bajee Rao was forced to discard Tum-

buctjee, receive a contingent force, and pay 34 lacs by treaty signed 13th June: Tumbuctjee for the time escaped.

Lord Hastings left Calcutta for the Upper Provinces 8th July; on the 10th October the Bengal armies were put in motion, and Lord Hastings assumed command of the centre division, 20th October, taking up a position near Gualior to awe Scindiah. Sir T. Hislop with the Deccan army from Madras, and Sir W. Keir from Bombay advanced against the Mahrattas.

Scindiah soon signed (5th November) the treaty imposed on him, and thus was rendered harmless in the ensuing struggle.

Ameer Khan followed his example on the 9th November. The Pindarees, the ostensible primary objects of our movements, were now in three bodies, 1st under Cheetoo, west of the Kalee Sind; the 2nd under Kureem Khan, near Bopal; the 3rd under Wazil Mahomed, to the westward of Saugor.

The Peshwah broke out on the 5th November in an attack on the Residency, but was repulsed by Mr. Elphinstone with the troops under Col. Burn. The Nagpoor Rájah Appah Sahib, next attacked the Residency of Nagpoor, on the 25th November, and on the 27th, Captain Fitzgerald of the 6th Cavalry decided the protracted contest by his celebrated charge. On the evening of the 16th December, Brigadier General Doveton attacked Appah Sahib at Nagpoor, and next day completely routed him. Appah Sahib intimidated came into our Camp.

The different divisions acting under Lord Hastings continued, to the end of the year, to pursue and destroy the hordes of Pindarees, now flying in all directions.

The Cholera Morbus, which had broken out in this year during the rainy season in the Delta of the Ganges, travelling westward attacked Lord Hasting's army, shortly after the conclusion of the treaty with Scindiah. The deaths were estimated at one-tenth of the army and followers.

Ameer Khan's treaty finally ratified 19th December, when he went into Sir David Ochterlony's Camp. Sir T. Hislop totally defeated the troops of Holkar at Mahidpore on the 21st December.—*(Prinsep.)*

1818.—On the 1st January Captain Staunton, with a single Battalion, gallantly beat off repeated attacks of the whole of the Peshwah's army, consisting 20,000 men. Holkar on his defeat at Mahidpore, immediately accepted the terms imposed on him; the same were ratified on the 17th January. Sutara taken by General Smith, 11th February. Bajee Rao for ever deposed, the Sutara family restored, and Sevajee's standard hoisted. The Ex-Peshwah was again defeated by General Smith on the 20th February; Gokla was slain, the forts of Bajee Rao fell, and himself became a fugitive. Lord Hastings, finding his plans nearly effected, commenced his march homewards on the 15th February. Talner attacked by Sir T. Hislop, 27th February, and carried after the loss of several officers by treachery, the Killadar was hanged. Mundella, which was to have been given up, was obliged to be stormed 26th April; the fort fell the next day: the Killadar was tried but acquitted, having private orders from his sovereign Appah Sahib*. Saugor surrendered 11th March. On the 17th April Bajee Rao's army was met at Soonee, and routed by Col. Adams with a small force. His remaining Infantry was attacked at Soolapore by Brigadier General Munro, and completely destroyed. Soolapore fell on the 15th May with the remains of his Artillery. Chanda was invested by Colonel Adams on the 9th May, it was stormed and carried on the 20th. Bajee Rao surrendered himself to Sir John Malcolm, on terms however very favorable for the Prince. Maligoan, garrisoned by the Arabs late in the Mahratta service, surrendered on the 13th June.

Thus, including the fall of Asseerghur in the following year (April 19th), was effected the entire subversion of the Mahratta powers. Scindiah became crippled, and existing only on sufferance. The Sutara family was restored, but subservient to our power, and restricted to a small domain. The late Peshwah Bajee Rao's power utterly destroyed, his dominions occupied, and himself a prisoner. Holkar submissive, and in complete check. The Nagpoor states new modelled: Bajee Rao Bhoola placed on the throne, but the government was placed under the controul and management of the British.—*(Prinsep.)*

1819.—A settlement made at Singapore by Sir Stamford Raffles, January. In western India the Fort at Newah taken, January 31st; that of Newtee February 4th; Raree February 14th; Booj March 23rd; Asseerghur March 30th; Copal Droog May 14th. An expedition from Bombay sailed October 30th for the Persian Gulph, and took the fortress of Ras el Khyma, the capital of the Joapmee Pirates, on the 9th December, and the Fort and Town of Zaya, about ten days later. The Spasmodic Cholera, which had broken out in India 1817, still raged in various parts of it.

* Appah Sahib's treachery being proved, he was placed under arrest: he made his escape again, 13th April.

The Vuzeer of Oude threw off his nominal allegiance to the Emperor of Delhi, and assumed the title of King*.

1820.—The Prince Azim Jah Bahadur installed Nawab of the Carnatic, February 3rd, vice Azim ul Dowla, who died the preceding August. Spasmodic Cholera broke out in Manilla, and the natives attributing it to the secret arts of Europeans, rose upon and murdered many of them, October 9. Dwarka in Okamandel taken, November 25th.

1821.—Peace concluded between Imam of Senna and the British Government, January 15th. The capital of the Arab Tribe of Beni Boo Ali, taken in March, by Colonel Lionel Smith. Napoleon Bonaparte died at St. Helena, March 5th. Revolution at the Portuguese settlement of Goa, September 6th. Cholera raging in Persia.

1822.—Dr. T. Fanshaw Middleton, the first Bishop of Calcutta, died July 8th. Severe Fire at Canton November 1st. Treaty with the Nizam, December 12.

1823.—January 9th, the Marquis of Hastings resigned his Government of India. Lord Amherst appointed his successor; assumed the Government 1st August.

1824.—War declared against the Burmese in consequence of their aggressions, March 5th. Rangoon taken by the British Forces, under Sir A. Campbell, May 11th. Island of Negrais taken, May 17th. Cheduba taken May 27th. Tavoy and Mergui taken, September 15th, and Martaban October 30th. Mutiny at Barrackpore; many Sepoys killed. November 2nd. Kemmendine and Dallah taken, 9th December. Nawab Mobaruck Ali Khan placed on the musnud of Bengal, Behar and Orissa, December 23rd.

1825.—Syriam taken from the Burmese, 11th January. Rungpore and Tantabair on the 2nd and 6th February. Donabew taken and the Burmese General Bundoolah killed, 2nd April. Ramree and Prome taken 2nd and 25th April. His Highness Azim Jah Bahadur, Nawab of the Carnatic, died November 12, aged 34. Wallygoun and Paghammew taken from the Burmese, 11th and 25th November. The Enterprise, the first Steam Vessel, sailed for India 16th August, arrived at Saugor December 8th. There was a rebellion at Bhurtpore on the Rájah's Death in February, and the British Government commenced operations to support the heir.

1826.—Bhurtpore stormed and taken by the Bengal Troops under Lord Combermere, January 18th; the British lost during the siege 45 officers killed and wounded, and 1500 men; the enemy lost some thousands, and the Usurper was seized. The Burmese defeated at Melloon by Sir A. Campbell, January 19th, and forced to conclude a peace, on the 24th February. War declared between Russia and Persia.

1827.—Sir T. Munro, Governor of Madras, died July 6th. Natives of India permitted to sit as Jurors, July 9th,

1828.—Treaty of Peace between Russia and Persia signed, February 22nd. Lord William Bentinck appointed Governor General of India, arrived in India, and took his seat in Council July 4th.

1829.—The Act for the Relief of Insolvent Debtors in the East Indies brought into operation, March 1st. Europeans allowed to hold lands in their own names on leases of 60 years in February of this year. The rite of *Suttee* abolished by Lord William Bentinck in December.

1830.—The House of Messrs. Palmer and Co. of Calcutta failed, 5th January, being the first of a series of failures of the leading houses to the extent of many millions sterling. H. M. George the 4th died, June 26th.

1831.—Ram Mohun Roy, a Brahmin, arrived at Liverpool from India, April 8th. Lord William Bentinck met Runjeet Sing at Roopur, October 25th.

1832.—Parsee Riots at Bombay, June 7th. Fire at the Arsenal Fort William, July 25th. An intended Mutiny discovered at Bangalore, October 28th.

1833.—The East India question debated in Parliament, and leave given to bring in a Bill for the renewal of the Charter, with some modifications, in March. The Bill was subsequently passed, August 18th. Its leading new provisions as follows: The British Indian Territories to remain under the Company till the 30th April 1854. Trade to cease from April 1834. All debts and liabilities made chargeable on Territorial Revenue. A dividend payable in Great Britain half yearly on East India Stock, at the rate of £10. 10s. per cent. redeemable after 1874 at £200 for every £100 stock. The Company to pay over to Commissioners for the reduction of national debt 2 millions, to increase at interest till it shall reach 12 millions, as a Security Fund of the East India Company. The Presidency of Fort William to be divided into two Presidencies *(since modified)*. The superintendence and control in India, Civil and Military, vested in a Governor General and Counsellors to be styled "the Governor General of India in Council." To have three

* In the following years the events are quoted on the authority of the Madras and Calcutta Register, the Gazettes, &c.

Ordinary Members of Council, Servants of the Company (a Military servant eligible) and a fourth Member, not a servant of the Company. The Governor General in Council empowered to legislate for India, and his Laws and Regulations to have the force of Acts of Parliament, subject however to disallowance by the home authorities. The Council may assemble in any part of India. A Law Commission appointed to inquire into existing Laws, the Court of Justice, Police, &c. Governors of other Presidencies to have same powers and immunities as heretofore, but not to make laws or grant money. British subjects, allowed to reside without licence in India with certain exceptions only: allowed to purchase land. Persons of all colours, religion or country admissible to any office or employment under the Company. His Majesty empowered to make Bishops for Madras and Bombay. Four candidates for students to be entered at Hayleybury for each vacancy in the Civil Service. St. Helena to be transferred to the Crown, &c. &c. Lord Napier appointed H. M.'s Chief Commissioner at Canton, November, after the ceasing of the Company's Factory.

1834.—War declared against the Rajah of Coorg, April 2nd. British Troops march into the country; Mercara capital of Coorg, surrendered April 6th, and the Rájah on the 10th. The China Trade stopped in consequence of disputes with the Commissioner, September 2nd. H. M. Ships Imogene and Andromache force the passage of the Bogue. Trade re-opened, September 23rd. Lord Napier died October 11.

1835.—Lord Heytesbury sworn in as Governor General in London, January 28th. Corporal Punishment in the Native Army abolished by Lord William Bentinck, February 25th. Lord William Bentinck quits Calcutta for Europe, March 20th. Sir Charles Metcalfe assumes the Government, March 21st. Lord Heytesbury's appointment as Governor General revoked by a new Ministry, May 4th. Lord Auckland appointed at home Governor General, August 12th.

Table XCII. *Classification of Native States, with which the British Indian Government is in alliance at the present time: with the approximate area of their territories, ascertained by dissecting and weighing a map. (See Journal of the Asiatic Society for* 1833, *page* 489.)

The area of the native states in alliance with the British Government was found to be,.....	449,845
That of the territory under British rule with the remaining small states and jágírdars,.....	626,746
Superficial area of all India,.....	1,076,591

The extent of coast from Cape Negrais to the frontiers of Sinde is 3622 British miles; the breadth from Surat to Silhet, 1260 miles.

[Hamilton says, that the superficial area of Hindustán between the latitudes of 8° and 35° north, and the longitudes of 68° and 92° east, cannot be estimated at more than 1,280,000 English square miles, and the portion belonging to the British and their allies at 1,103,000; this estimate agrees very nearly with the above result of weighment.]

Captain Sutherland classifies the native states of India under the three following heads:

I.—*Foreign*, viz. Persia, Kabul, Senna, the Arab tribes, Siam, Acheen.

II.—*External, on the frontier*; viz. Ava, Nepal, Lahore, Sinde.

III.—*Internal*, which are those included in the present list. All of these have relinquished political relations with one another and with all other states. They are, according to the nature of their relations or treaties with the English, divided into six classes.

First Class. *Treaties offensive and defensive: right on their part to claim protection, external and internal, from the British Government: right on its part to interfere in their internal affairs.*

	Square miles.	Square miles.
1. Oude, containing, by weighment,....	23,923	by Hamilton*, 20,000
2. Mysore,.....	27,999	 27,000
3. Berar or Nágpúr,.....	56,723	 70,000
4. Travancore,.....	4,574	 6,000
5. Cochin,.....	1,988	 2,000

* This column, and other items marked H., are extracted from Hamilton's Hindustan by way of comparison.

SECOND CLASS. *Treaties offensive and defensive: right on their part to claim protection, external and internal, from the British Government, and to the aid of its troops to realize their just claims from their own subjects: no right on its part to interfere in their internal affairs.*

		Square miles.		Square miles.
6.	Hyderabad, containing, by weighment,	88,884	by HAMILTON,	96,000
7.	Baroda,	24,950		12,000

THIRD CLASS. *Treaties offensive and defensive: states mostly tributary, acknowledging the supremacy of, and promising subordinate co-operation to, the British Government; but supreme rulers in their own domains.*

8. Indore, containing, ... 4,245 square miles.

Rajputána States.

		Square miles.			Square miles.
9.	Oudípúr, (H. 7,300,)..	11,784	16.	Jesalmír,	9,779
10.	Jeypúr,	13,427	17.	Kishengurh,	724
11.	Jodhpúr,	34,132	18.	Banswára,	1,440
12.	Kotah, (H. 6,500,)	4,389	19.	Pertábgurh,	1,457
13.	Búndí, (H. 2,500,)	2,291	20.	Dúngarpúr,	2,005
14.	Alwar,	3,235	21.	Kerolí,	1,878
15.	Bikanír,	18,060	22.	Serowí,	3,024

			Square miles.
23.	Bhartpúr, (by HAMILTON, 5,000,)		1,946
24.	Bhopal, (ditto 5,000,)		6,772
25.	Kutch, (H. with the Runn 13,300,)		7,396
26.	Dhár and Dewas,		1,466
27.	Dhólpúr,		1,626
28.	Rewah,		10,310
Boghelkhand, and Bundelkhand, 29.	Dhattea, Jhánsí, Terhí,		16,173
30.	Sawantwarí,		935

FOURTH CLASS. *Guarantee and protection, subordinate co-operation, but supremacy in their own territory.*

31.	Ameer Khan,	Tonk, 1,103 Seronj, 261 Nimbahara, 269		1,633 square miles.
32.	Patiala, Keytal, Naba and Jeend,			16,602

FIFTH CLASS. *Amity and Friendship.*

33. Gwalior, containing, ... 32,944 square miles.

SIXTH CLASS. *Protection, with right on the part of the British Government to control internal affairs.*

34.	Sattara, containing,	7,943 sqnare miles.
35.	Kolapúr,	3,184

Of the above states, four are Mohammedan; viz. Hyderabad, Oude, Bhopal, and Tonk. Of the Hindu states, eight are Marhatta; viz. Sattara, Gwalior, Nagpúr, Indore, Banda, Kolapúr, Dhar, and Dewas.

Nineteen are Rajput; viz. Oudípúr, Jeypúr, Jodhpúr, Búndí, Kotah, Kutch, Alwar, Bikanír, Jesalmír, Kishengarh, Bánswára, Pertábgarh, Dungerpúr, Kerolí, Serowí, Rewah, Dhattea, Jhansí, Terhí.

Six are of other Hindu tribes; viz. Mysore, Bhartpúr, Travancore, Sáwantwárí, Cochin, and Dholpúr.

Besides these allied states, there are the following inferior Rajships and Jágírdaris: viz. Chota Nagpúr, Sirgújer, Sambhalpúr, Singhbhum, Oudípúr, Manipúr, Tanjore, the Bareich family, Ferozpúr, Merich, Tansgaon, Nepaní, Akulkote, and those of the Ságar and Nerbudda country; also Sikkim and the states of the northern hills.

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